"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HEMODIALYSIS PATIENTS AT ERODE AND NAMAKKAL DISTRICT"

By

301610701

Dissertation submitted to
The Tamil Nadu Dr.M.G.R. Medical University, Chennai.
In partial fulfillment of the requirements for the degree of
Master of Science
In
Medical and Surgical Nursing

OCTOBER 2018

"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HEMODIALYSIS PATIENTS AT ERODE AND NAMAKKAL DISTRICT"

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DEGEREE OF MASTER OF SCIENCE (NURSING)

The Tamilnadu Dr. M.G.R Medical University, Chennai-32

OCTOBER – 2018

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CERTIFICATE

This is to certify that, this thesis, **"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HEMODIALYSIS PATIENTS AT ERODE AND NAMAKKAL DISTRICT"** Submitted by ANUPREETHI.S, M.Sc. Nursing (2016-2018 Batch), Vivekananda College of Nursing in partial fulfillment of the requirement of the Degree of Master of Science (Nursing) from The Tamilnadu Dr. M. G. R. Medical University is her original work carried out under our guidance.

This thesis or any part of it has not been previously submitted for any other Degree or Diploma.

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DECLARATION

I hereby declare that, this thesis entitled **"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HEMODIALYSIS PATIENTS AT ERODE AND NAMAKKAL DISTRICT"** is the outcome of the original research work undertaken and carried out by me under the guidance and direct supervision of research advisor, **Prof. SHEELAVATHI.N. M.Sc (N)., Ph.D.,** and clinical specialty guide, **Prof. M. GEETHA, M.Sc (N)., Ph.D.,** Department of Medical-Surgical Nursing, Vivekanandha College Of Nursing, (Sponsored by Angammal Educational Trust), Elayampalayam, Tiruchengode, Namakkal District.

I also declare that, the material of this thesis has not formed in any way the basis for award of any other Degree, Diploma or Associate fellowship previously of the Tamilnadu Dr. M. G. R Medical University.

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ACKNOWLEDGEMENT

"Challenges are what make life interesting and overcoming them is what makes life meaningful"

There are several hands and blessings behind this work to bring it to this final shape, for which I would like to express my gratitude. It is with gratitude that I wish to acknowledge all those who have enriched and crystallized my study.

I express my deep sense of gratitude to the **God Almighty** for the blessings and mercy which enabled me to reach up to this step and complete my study.

I extend my heart full thanks to **VidhyaRathna, Rashtriya Ratan, Hind Ratan, Kalvi yogi, Prof. Dr. M. Karunanithi, B.Pharm, M.S., Ph.D., and D.Litt.** The chairman and secretary of Vivekanandha Educational Institutions for providing me an opportunity to undertake M.Sc. nursing programme in this esteemed institution.

It's my privilege to extend my thanks **Mrs. Krishnaveni Karunanithi, M.A.,** Managing Director of Vivekanandha Educational Institutions for providing me an opportunity to undertake this investigation in Vivekanandha College of Nursing.

I extend my sincere thanks to **Dr. Krupanithi Karunanithi M.B.B.S., MD.,** Vice-Chairman of Vivekanandha Medical Care Hospital & Vivekanandha Educational Institutions for granting permission to conduct the study.

I extend heartfelt thanks to **Dr. S. Arthanareeswaran, MD.,** Joint Managing Director of Vivekanandha Medical Care Hospital & Vivekanandha Educational Institutions to undertake this investigation in Vivekanandha College of Nursing.

I extend heartfelt thanks to **Dr. K. Sreeraganidhi Arthanareeswaran M.S.,** (Ophthalmology), Joint Secretary of Vivekanandha Medical Care Hospital Vivekanandha Educational Institutions.

I extend my heartful thanks to **Dr. Nivethana Kirupanithi**, **M.B.B.S, DGO,** Executive Director, Vivekanandha Medical Care Hospital & Vivekanandha Educational Institutions.

Nursing is a noble profession and the teachers who teach they are really equal to god. It is my privilege to acknowledge them who gave the strength in my carrier at all the levels. Whatever changes occur towards as time passes nothing is equal to replace the place of teachers. It is by the guidance of my teachers that, I could possible to stand in this position where I am.

It is with great privilege I extent my heartfelt thanks and honorable appreciates to **Prof. Mrs. Sheelavathi. N. MS.c (N)., Ph.D.,** Principal, Vivekanandha College of Nursing for her genuine concern, continued motivation and constructive suggestion, above all her interest in perfection throughout this study. Without her support my study would never taken up in shape.

It is my pleasure and privilege to express my heartfelt and sincere thanks and honorable appreciation to my esteemed subject guide **Prof. Mrs. M. Geetha, MS.c (N))., Ph.D.,** department of Medical-Surgical Nursing, for her thought provoking stimulation, timely help and highly constructive suggestions in each step of my study, without her support I can't enjoy the fruit of success.

It is my privilege to express my thanks and deep sense of gratitude to my class coordinator **Mrs. R. Gowri, M.Sc (N),** Associate professor in Medical-Surgical Nursing for her valuable suggestions and encouragement.

I express my sincere and special thanks to **Mr. S. Sudharsanam, M.Sc, M.Phil (Statistics),** Assistant professor in Statistics, Vivekanandha College of Nursing for his expert guidance and valuable advice in statistical analysis and presentation of data.

I wish to express my heartfelt gratitude for all **Faculty Members** of Vivekanandha College of Nursing for their valuable Guidance and suggestions in the completion of the study.

My sincere thanks to all **Subject Experts** who spent their valuable time for validating my tool, editing my study and making it a meaningful one.

I am grateful to the **Tamil** and **English** teachers for sharing their valuable time in translating the tool and editing the thesis.

I am also thankful to the **Librarian and Assistant Librarian** of Vivekanandha College of Nursing Elayampalayam, for helping me with the review and for providing all library facilities throughout the study.

I extent my sincere thanks to **The Chief Medical Officer,** of Dr. K. M. Nallasamy Hospital, Erode for granting permission to conduct the study.

I am grateful and thankful to **The Staff Nurses** of Dr. K. M. Nallasamy Hospital, Erode and VMCH Hospital, Elayampalayam and for their co-operation and help during my study.

I express my heartfelt thanks to all **the patients** who participated in this study and without their co- operation the study would have remained as dream.

I feel a deep sense of gratitude for the staff of **Digital Park** for sharing their valuable time in helping for analyzing the data.

True love is rare, and it's the only thing that gives life real meaning. We are what we are with the blessing and love of our dear and near one. It would not have been possible for me to complete this work without the love and support of my lovely father **Mr. Selvan Palaniyappan,** my lovely mother **Mrs. Kalavathi Selvan,** my loving, caring, motivating brother **Mr. Vinoth Kumar Selvan,** who initiated me to take up this noble profession and also for their prayers, support and inspiration throughout the Course of my study.

I am always obligated to my lovely grandmothers **Mrs. S. Sarojini** and **Mrs. K. Palaniyammal for** their affectionate enduring support, love, sincere prayers and blessings throughout my career.

I express my heartfelt respect and sincere thanks to my uncle **Mr. Kalaiselvan Varadhappan** for their constant support and inspiration throughout my carrier. I am immensely indebted to my lovely, kind and devoted friend **Mr. Anandha Kumar Moorthy,** without who this effort would have been worth nothing. His love, support, and constant patience have taught me much about sacrifice, discipline and compromise. His firm and kind hearted personality has affected me to be steadfast and never bend to difficulty. His support has made me a driven individual. I will be forever grateful to him and hope that someday, will be able to return a fraction of his generosity.

I express a gratitude to my sister **Mrs. Grazy Senthil Kumar, M.Sc (N)., Ph.D.,** Department of Medical – Surgical Nursing, Dhanvanthri College of Nursing, Namakkal.

I extend a special thanks to my friends for their constant support and help throughout the study.

I also wish to thank **Space Digital Works, Vattamalai** for his support and helping me to complete data as a printing format.

I render my deep sense of gratitude to **all my seniors, my classmates, my friends, and my juniors** for their kind help throughout the study.

I express my warm appreciation to all those who have helped me directly and indirectly to make the fruition of this study possible.

Ms. ANUPREETHI.S

ABSTRACT

This thesis titled **"A study to assess the effectiveness of cold application on arteriovenous fistula puncture pain among hemodialysis patients at Erode and Namakkal District"** is conducted by S. Anupreethi in partial fulfillment of the requirement for the degree of Master of Science in Nursing during the year 2016-2018.

OBJECTIVES

- To assess the arteriovenous fistula puncture pain among haemodialysis patients in Experimental and Control group.
- To compare the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients between experimental and control group.
- To find out the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in Experimental and Control group.
- To find out the post-test score of arteriovenous fistula puncture pain with selected Clinical data in Experimental and Control group.

The conceptual frame work adopted for this study was Modified Orlando's Nursing Process of research use, which addresses the implementation of existing research knowledge. The review of literature helped the investigator to develop conceptual frame work, determine the methodology for the study, and plan for analysis of the data in the most effective and efficient way.

The research approach adopted for the study was Non-randomized control group post-test only design. Quasi experimental design is the powerful tool for testing of hypothesis, causes, effect and relationship between the variables.

In this study, the investigator test the relationship between independent and dependent variables, the independent variable is cold application and dependent variable is arteriovenous fistula puncture pain.

The study was conducted in Dr. K.M.Nallasamy hoapital, Erode and VMCH hospital, Namakkal District, Tamilnadu. Non - purposive sampling technique was used to select the sample. After that, the samples were equally divided into experimental and control group. The samples consisted of 25 in experimental group and 25 in control group. The tool used for data collection was Semi structured interview schedule. It has 3 sections.

Section – A consists of socio demographic variables.

Section – B consists of clinical data.

Section – C consists of Numerical Pain Assessment Scale to assess the pain response of subjects during arteriovenous fistula cannulation.

The pilot study was conducted during February 23.02.2018 to 27.02.2018 in Kalyani Kidney Care Hospital, Erode. About 10 samples were selected using non-probability convenience sampling technique. 5 samples were in experimental group and 5 were in control group. Confidentiality was assured to the subjects. The semi-structured interview schedule was used among 10 patients. Cold application was administered to the patients in the experimental group. The reliability of the tool was r

= 0.93 established by inter rater reliability. The instrument was found to be reliable to conduct the study. The purpose of the study were

- To find out the feasibility of conducting final study.
- To test the tool.
- To determine the method of statistical analysis.

The Main study was conducted from 01.03.2018 to 30.03.2018 in Dr.K.M.Nallasamy hoapital, Erode and VMCH hospital, Namakkal District. Non-probability convenience sampling technique was used. The intervention was given only to experimental group. The data gathered were analyzed and interpreted in terms of objectives. Descriptive and inferential statistics were used in data analysis. The Result of the study revealed that, after cold application, the Mean pain score in the experimental group were 2.4 where as in control group the Mean pain score were 3.6 In the experimental group, Maximum pain score was 5, where in control group the maximum pain score was 9.

MAJOR FINDINGS OF THE STUDY

1.1. Findings related to socio demographic variables.

- About 13(52%) subjects belong to the age group of 41 – 60 years.
- Most of the subjects 19(76%) were males.
- About 14(56%) subjects studied up to primary education.
- Most of the 18(72%) subjects were unemployed.
- Majority of the subjects 22(88%) were married.
- Majority 24(96%) subjects were belonging to nuclear family.

- Most of the 18(72%) subjects had sleep at night time between the duration of 4 – 6 hours.
- Majority 20 (80%) of the subjects were non – vegetarian.
- About 14(56%) of the subjects had no personal habits
- Majority 21(84%) of the samples were watching television during dialysis procedure.

1.2. Findings related to clinical data.

- Majority of subjects 24(96%) were known case of chronic renal failure.
- Majority 21(84%) of the subjects having arteriovenous fistula in their left arm.
- Nearly half of the subjects 14(56%) had brachio – cephalic site of arteriovenous fistula.
- All of subjects 25(100%) attending duration of hemodialysis is 4 hours.
- Majority 22(88%) of the subjects were attending dialysis twice in a week and 8 times per month.
- Nearly half of the subjects 14(56%) had area cannulation.
- All the subjects 25(100%) had arteriovenous needle puncture in the size of 16 G (green).
- Majority 19(76%) of the subjects had no complications of arteriovenous fistula.

2. Effectiveness of cold application on arteriovenous fistula puncture pain.

This study revealed that, in experimental group among 25 patients, 16(64%) experienced mild pain, 5(20%) experienced moderate pain, 4(16%) experienced no pain and none of them experienced severe and worst pain during arteriovenous fistula puncture. But, in control group among 25 patients, 12(48%) experienced mild

pain, 8(32%) experienced moderate pain, 3(12%) experienced severe pain, 2(8%) experienced no pain, and none of them experienced worst pain during arteriovenous fistula puncture.

Followed by, in experimental group the Mean pain score is 2.4, Mean percentage is 9.230 and standard deviation is 1.46. In control group, the mean pain score is 3.6, Mean percentage is 13.846 and standard deviation is 2.37. The‘t’ value is 2.14 ($p = 0.05$, 48 df, $t=1.96$) which is statistically significant and this study showed that, the cold application is effective in reducing arteriovenous fistula puncture pain.

3. Assessment of post-test score of pain in experimental and control group with Socio demographic variables.

Chi-square test was used to assess the post-test score of pain in experimental and control group with socio demographic variables. It was concluded that age, gender, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits recreational activities during dialysis procedure were non-significant at 0% level.

4. Association between post test pain score in the experimental group with selected clinical data.

Chi-square test was used to assess the post-test score of pain in experimental and control group with selected clinical data. It was concluded that Co – morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patients weight in kilograms, techniques of arteriovenous cannulation, size of arteriovenous cannula used were non-significant at $P \leq 0.05$ level.

In the light of the above study the following recommendations are put forth

- A similar study can be conducted for a large sample to draw more conclusive generalization.
- A comparative study can be conducted with two different age groups.
- A study can be conducted by using cold application as a pain relief measure before intravenous cannula insertion.
- A similar study can be conducted by using cold application as a pain relief measure for stomach cramps for peritoneal dialysis patients.

CONCLUSION

The present study showed that samples in the control group had pain upto severe pain during post test, but after the cold application there was a significant reduction upto moderate pain in experimental group. The pain scores remains same and even some clients' pain level got increased among control group. This implies that cold application is effective on arteriovenous fistula puncture pain among hemodialysis patients. And this effect was demonstrated through Numerical pain assessments scale.

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CHAPTER – I

INTRODUCTION

"If I didn't have this sickness I would not be the person I am today,

I have strength within myself that I didn't know ever existed"

- *Starr Andrews Strong*

Nephrons are the functional units of kidneys. A person is specially born with about 2 million nephrons (about 1 million nephrons in each kidney) filter around 120 to 150 quarts of blood each day. The kidney damage occurs when Glomerular Filtration Rate (reflected in creatinine clearance measurements) is less than 60mL/min/1.73 m^2 and if it remains for longer than 3 months this damage leads to Acute Kidney Failure. The cause might be a chronic, or long-term condition, or an acute problem, such as an injury or a short-term illness that affects the kidneys. **(KDOQI, 2006)**

In the majority of cases (70%) of individual passes through the early stages of Chronic Kidney Disease followed by acute renal failure without recognizing the disease state because the remaining nephrons hypertrophy to compensate. **(USRDS, 2012)**

The increasing prevalence of Chronic Kidney Disease has been partially attributed to the increase in risk factors, including an aging population, rise in rates of obesity, and increased incidence the leading causes are diabetes (about 50%) and hypertension (about 75%). **(National Kidney Foundation, 2017)**

Although Chronic Kidney Disease has many different causes, less common aetiologies include glomerulonephritis, cystic diseases and urologic diseases vary considerably throughout India. In India, certain parts of the states of Andhra Pradesh, Odisha, and Goa have high levels of Chronic Kidney Disease of unknown etiology (CKDu), which is a chronic interstitial nephropathy with insidious onset and slow progression. **(Rajagopalan et al, 2016)**

Dialysis prevents the waste products and removes excessive fluids from blood when the kidneys cannot do the job properly that reaching to hazardous levels. It can also remove toxins or drugs from the blood in an emergency setting. There, it creates an extracorporeal circuit, while blood is taken from the circulation to a dialyser for cleansing, and then returned to the patient's body. The system works like an artificial kidney. **(Nursing times, Oct 21, 94, 42, 1998)**

Procedural arteriovenous fistula puncture pain is an important source of discomfort for haemodialysis patients. Non pharmacological therapies are quiet effective in offering pain relief. Nurses use this therapy to lessen the reception and perception of pain. Thus, study has shown that the cold application given on the cotralateral hand reduces the puncture pain in hemodialysis patients. **(Rakel and Barr, 2003)**

NEED FOR THE STUDY

Chronic kidney disease is now recognised as a major medical problem worldwide. The Global Burden of Disease (2015) study in India, ranked chronic kidney disease as 17th disease among the causes of deaths globally (age-standardised

annual death rate of 19·2 deaths per 100 000 population) In many countries, chronic kidney disease is now among the top five causes of death. **(Sembulingam K, 2006)**

In the Lancet Global Health, Dare and colleagues present data on the number of deaths due to renal failure in India. These figures come from the Million Deaths Study (MDS), described the cause to all deaths in a nationally representative sample of 1·1 million households using an enhanced verbal autopsy tool between 2001 and 2013. Deaths due to renal failure constituted 2·9% of all deaths in 2010–13 among 15–69 year-olds, an increase of 50% from 2001–03. Diabetes was the largest contributor to renal failure deaths. Substantial regional differences were noted in renal failure death rates. The reported proportion of renal failure deaths is close to the GBD 2015 estimate of 3·04%, up from 1·94% in 2000. **(Linda & Paula D, 2006)**

Dialysis effectively treats the signs and symptoms of uremia and fluid overload (some of which may be life threatening), it is a lifelong therapy that is associated with discomfort, inconvenience, and some risk for the patient. So, it should be started when the benefit from relieving uremic signs and symptoms is thought to outweigh its risk and associated effect on quality of life, but not before this time. **(Anthony Bleyer, 2018)**

Hemodialysis is usually done three times a week, for 3-4 hours a day, depending on how well the patient's kidneys work, and how much fluid weight they have gained between treatments. Patients who are going to have hemodialysis need arteriovenous fistula surgery to enlarge a blood vessel, usually in fore-upper arm with an anastomosis between an artery and a vein (usually cephalic or basilica). This

is left for Maturation, takes between 6 weeks to months. The use of the subcutaneous internal arteriovenous native fistula was introduced by Cimino and Brescia, in 1966. **(Chailimpamontree, W. et al. 2009)**

The needles used for hemodialysis (HD) are large bore, usually 14 to 16 gauges, and are inserted into the fistula to obtain vascular access. **(Rosener MH, 2005)** ArterioVenous Fistula creation was successful in 22 out of 27 patients (81.5%) over a period of about 10 years. The estimated detection rate of arteriovenous fistula in the India general population is 1.2/100,000 per year. An estimated 300,000 Indians have arteriovenous fistula, of which 10% (approximately 30,000) will exhibit symptoms of pain. **(Srivastava S et al, 2018)**

Arterio Venous Fistula punctures cause pain; it is a deep somatic nociceptive pain, caused by stimulation of sensory nerve fibres that respond to stimuli approach or exceeding harmful intensity (nociceptors). **(Crespo Montero R et al, 2004)**

Cold application is a cutaneous stimulation technique and an inexpensive nursing intervention that is advocated to minimize pain in patients. The effect of cutaneous stimulation is best explained through gate control theory proposed by Melzac in 1965. According to this theory touch impulse are transmitted to the spinal cord greatly by A- delta fibers and pain impulse by the C-fibers. If the impulse transmission in thick fibers (touch) can be increased, this selectively blocks conduction in the thin fibers (pain) by closing a gate consisting of specific nerve cells in dorsal horn of spinal cord. The impulse from cold application is also transmitted by the touch fibers. The conduction rate of touch stimulus is more and it is the meridian points, the large intestine meridian point are the acupressure points

present in arms, extending up to the nose. There are 20 large intestine meridian points. L14 is the point present on the medial midpoint of the first metacarpal between 3 to 4mm of the web of skin between thumb and forefinger on either hand. Its dominant users are to relieve pain in arms, legs and scapula for reducing labor pain and rigidity of neck as a treatment measure. **(Sally Goluboff, L.Ac. 2015)**

The mechanism of cold application is conditional on the ability of extreme cold (<-20°C) to cause a short-term degeneration of nerve axons and destruction of the sheath architecture. The axons will regenerate gradually in a few months. These result in a local anesthetic effect called cold-induced neuropraxia. Cold application is a method that removes heat from the body resulting in decreased tissue temperature. It decreases tissue blood flow by causing vasoconstriction and reduces tissue metabolism and muscle spasm. **(Barnard, 2015)**

Cold application has been clinically used as an effective alternative therapy to alleviate pain. Previous studies have shown that the mechanisms by which cold therapy might elevate pain threshold include a decrease in nerve conduction, reduction in muscle spasms, and prevention of edema after injury. **(Ernst E, Fialka, 1994)**

The analgesic effect of cold application can be explained by the gate control theory proposed by Melzack and Wall in 1965 that cold application activates descending inhibitory neurons that prevent the ascending nociceptive neurons from sending pain signals to the brain. **(Melzack R, Wall PD, 1965)**

This thereby “closes the gate” to pain, and our brain will not interpret the impulse as painful. **(Demir Y & Khorshid L, 2011)** With regard to the duration of

cold application, 10-minute cold application, which decreases the skin temperature to 13.6°C, can have an effective analgesic effect. **(Bugaj R, 1975)** The other report demonstrated that a 10- to 20-minute cold application can potentially decrease the skin temperature to 10°C to 15°C and have a local analgesic and swelling-reducing effect. **(Greenstein G, 2007)**

When I worked in a dialysis unit as a staff nurse, I observed the patients with hemodialysis had pain during AV fistula cannulation. There, I felt an alternative therapy is required in reducing pain. So, I decided to know the effectiveness of cold application on arteriovenous fistula puncture pain among patients undergoing hemodialysis procedure. Hence, it will be useful for the patients having frequent hemodialysis in the arteriovenous fistula.

STATEMENT OF THE PROBLEM

"A study to assess the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients at Erode and Namakkal District"

OBJECTIVES

- To assess the arteriovenous fistula puncture pain among haemodialysis patients in Experimental and Control group.
- To compare the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients between experimental and control group.
- To find out the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in Experimental and Control group.

- To find out the post-test score of arteriovenous fistula puncture pain with selected Clinical data in Experimental and Control group.

HYPOTHESIS

H_1 : There is a significant difference in the arteriovenous fistula puncture pain among haemodialysis patients in experimental group.

H_2 : There is a significant association between the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in experimental and control group.

H_3 : There is a significant association between the post-test score of arteriovenous fistula puncture pain with selected Clinical data in experimental and control group.

OPERATIONAL DEFINITIONS

Assess: Assess refers to a statistical measurement of the arteriovenous fistula puncture pain among hemodialysis patients.

Effectiveness: Effectiveness refers to the significant difference in the pain score among experimental group after cold application as evidenced by post-test score.

Cold application: In this study, cold application refers to the application of an ice cube (3x2.5cm) within a glove between the thumb and forefinger (3 to 4mm of the web of skin) of the contra lateral hand for a period of 10 minutes prior to arteriovenous fistula cannulation

Arteriovenous fistula puncture pain: In this study, it refers to the pain perceived by the hemodialysis patients (20 – 80 years) during arteriovenous fistula puncture in their hand.

Hemodialysis: Hemodialysis is a procedure done by a machine for removing waste products from the blood of the patients in the state of kidney failure.

Patients: In this study, it refers to the persons who were undergoing hemodialysis between the age group of 20 – 80 years.

ASSUMPTIONS

1. Cold application before and during arteriovenous fistula cannulation will help to reduce the puncture pain among patients undergoing haemodialysis.

2. Socio-demographic variables like age, gender, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits, and recreational activities during dialysis procedure may influence the effectiveness of cold application on arteriovenous fistula puncture pain.

3. Selected clinical data like Co – morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patients weight in kilograms, techniques of arteriovenous cannulation, size of arteriovenous cannula used may influence the effectiveness of cold application on arteriovenous fistula puncture pain.

LIMITATIONS

- The study is limited to assessment of specific aspect i.e. score of arteriovenous fistula puncture pain of the patients undergoing haemodialysis.
- The study is limited to two hospitals.
- The study is limited to the sample size of 50.
- The study is limited to five weeks.

CONCEPTUAL FRAMEWORK

A conceptual framework or a model is made up of concepts, which are the mental images of the phenomenon. It offers framework of prepositions for conducting research. These concepts are linked together to express the relationships between them. A model is used to denote symbolic representation of the concepts. The conceptual framework and model adopted for the study is based on the Ida Jean Orlando who was one of the earliest leaders in the field of nursing, developed her theory in 1961, she furthered the development of her theory and published it as nursing process theory in 1972. This model focuses on how to produce improvement in the patient's condition and stresses the reciprocal relationship between patient and nurse. It asserts that the limitations on the patient's ability to meet their needs independently arises when the patient is receiving medical care or under medical supervision. It follows the step in nursing process and meets the patient's needs. The theorist concept of nursing, person, health and environment are all interpreted to thus central concept.

Patients' behaviour

The nursing process is a set in motion by the patient's behavior. All patients' behaviour may represent cry for help. The patient who cannot resolve a need feels helpless, and the person's behaviour reflects this feeling. In this study, the investigator considered clients undergone arteriovenous fistula with hemodialysis presenting behaviour of the patients is expressed in terms of verbal or non verbal language. The investigator considered as the level of pain the clients undergone anteriovenous fistula with hemodialysis.

Nurses' reaction

This reaction is based on above given pharmacological and non pharmacological intervention, measures 50 samples reaction on the basis of determining how they act and their behaviour. It consists of perception, thought, and feeling. First, what the investigator says to the patient must match one or all of the items contained in the immediate reaction; what the investigator does non-verbally, the subject must be verbally expressed, and this expression must match one or all of the items in the immediate reaction. Investigator action by delivering the needed can be solving the patient's problem. In this study, the investigator problem by cold application, this action helps in pain reduction and improves the patient comfort.

Nurses' activity

The deliberative actions involve exploring the meaning and relevance of an action to the patient. These actions evaluated effectiveness immediately after intervention, which is when an investigator influenced by a stimulus related to the patient's need should perform an intervention. In this study, the patients grimace is pain, the investigator response is to validate the patient's behaviour and perform a cold application. Investigator administered only cold application for experimental group. Pharmacological measures not used for experimental and control group.

SUMMARY

This chapter deals with introduction, need for the study, and statement of the problem, objectives, operational definitions, assumptions, limitations and conceptual frame work of the study.

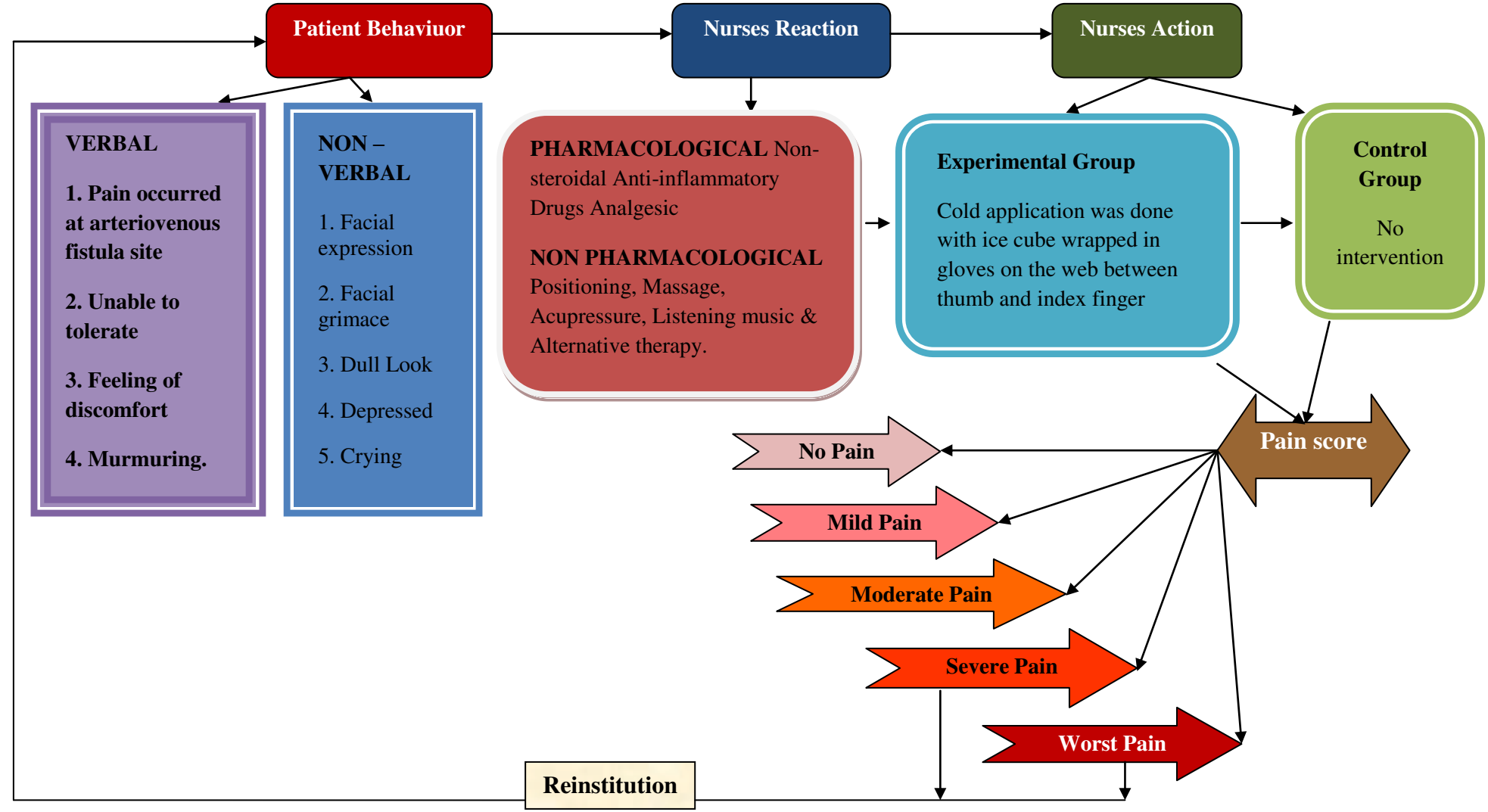

FIG. 1.1: CONCEPTUAL FRAMEWORK BASED ON MODIFIED ORLANDO'S NURSING PROCESS (1972)

CHAPTER – II

REVIEW OF LITERATURE

A Literature Review is "a systematic, explicit, and reproducible method for identifying, Evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners." **(Arlene Fink, 2015)**

A literature review is an assessment of a body of research that addresses a research question. **(Carla Lillvik, 2014)**

The literature found relevant and useful for the present study has been organized under the following headings.

- Studies related to Prevalence of Kidney failure and Dialysis.
- Studies related to ArterioVenous fistula.
- Studies related to pain during ArterioVenous Fistula puncture.
- Studies related to Effectiveness of Cold application on ArterioVenous Fistula Puncture Pain.

I. STUDIES RELATED TO PREVALENCE OF KIDNEY FAILURE AND DIALYSIS

Suresh H et.al, (2018) conducted a prospective observational study on a new and pernicious complication of pulmonary hypertension (PH) in patients with chronic kidney disease, treated at Karnataka Institute of Medical Sciences, Hubli Karnataka. The aim of this study is to analyze the prevalence of PH in patients with

CKD, its severity in different stages of CKD, and risk factors for it. The sample size of the study was 108 patients. The finding showed that the mortality rate among those with PH was significantly higher, compared to those without PH (P = 0.03). Hence this study concludes that substantial number of the patients with CKD develops Pulmonary Hypertension.

Chimezie Godswill Okwuonu et.al, (2017) conducted a cross-sectional study on Prevalence of chronic kidney disease and its risk factors among adults in a semi-urban community of South-East Nigeria. About 400 adults were randomly selected for the study by used a multistage systematic sampling technique. The data were assessed using the WHO stepwise approach. The Instrument covers three different levels or steps of risk factor assessment. These steps are questionnaire, physical measurements and biochemical measurements. The study showed that overall the prevalence of Chronic Kidney Disease was 7.8%. The prevalence of some established Chronic Kidney Disease risk factors was old age 36.3%, hypertension 36.9%, diabetes mellitus 7.9%, and 6.4% family history of kidney disease, The study concludes that prevalence of Chronic Kidney Disease and some of its risk factors were high. Effective control of the modifiable risk factors identified will assist in reducing the burden of Chronic Kidney Disease. Based on the outcome of this study, we recommend the development of a well-structured health education programme in the community.

Brendon Lange Neuen et.al, *(*2017) conducted a cross-sectional survey to assess need and capacity for kidney care worldwide and provide the foundation for a global surveillance network for chronic kidney disease (CKD) care. The study stated that, the kidney disease was the 12th most common cause of death, accounting for

1.1 million deaths worldwide. Overall CKD mortality was increased by 31.7% over the last 10 years, making it one of the fastest rising major causes of death. The prevalence of diabetic kidney disease increased by 39.5% globally. And obesity is a significant marker of risk for chronic kidney disease. Thus study concluded that, there is evidence that weight reduction in chronic kidney disease reduces proteinuria and blood pressure and may slow decline in renal function.

R Ahlawat, P Tiwari, S D'Cruz, R Singhal (2015) did a Systematic Review and Meta-Analysis of Observational Study on Prevalence of Chronic Kidney Disease in India. Five studies were selected as per inclusion criteria. These studies covered the different geographical regions in India. The numbers of participants ranged from 2091 to 5588.Modification of Diet in Renal Disease (MDRD) formula for GFR calculation and Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) formula was used by all studies. Overall prevalence of end stage renal disease (ESRD) was 0.27% Pooled estimate for the prevalence of protein urea was 6.98%. The prevalence of CKD, according to MDRD and CKD-EPI was 3% and 4%, respectively. Thus the study concludes that the Hypertension (49%) was found to be most commonly occurring co-morbidity. About 7% of the Indian patients were found to have proteinuria.

Almaguer M et.al, (2014) conducted a cohort study on CKD of unknown etiology (CKDu) in agricultural communities at certain areas of Sri Lanka and Andhra Pradesh. The sample consisted of 2728 adults (aged 18 and above) were chosen by Cluster sampling technique used. The study showed the multifactorial conditions associated with CKDu development are already present in many countries like poor and agricultural communities, it is crucial to coordinate efforts to

identify etiological factors as well as to develop proactive and comprehensive approaches to prevent and treat the disease.

Singh NP et.al, (2009) conducted a cross-sectional and observational study on Prevalence of low glomerular filtration rate, proteinuria and associated risk factors in North India. A total of 3,155 males and 2,097 females were selected by Cluster sampling technique. Cockcroft–Gault (CG) and Modification of Diet in Renal Disease (MDRD) equations were used to estimate GFR (eGFR). The result revealed that the unstandardized prevalence of low eGFR was 13.3% by CG equation and 4.2% by MDRD equation. The survey population had a 2.25% prevalence of proteinuria and only 3.3% of subjects with renal impairment were aware of their disease. Thus study concludes that the prevalence of low eGFR in North India is probably high. The primary prevention and management targeted at CKD risk factors must play a critical role in controlling rising CKD magnitude. The Cost-benefit analysis of targeted screening programs is needed.

II. STUDIES RELATED TO ARTERIOVENOUS FISTULA

A Srivastava (2018) conducted a prospective study on Role of preoperative duplex ultrasonography to predict functional maturation of wrist radio-cephalic arteriovenous fistula among 173 patients of Indian population. The aim of this study was to determine the role of preoperative duplex USG (DUS) for prediction of functional maturity of radiocephalic fistula in the wrist. The study analysed that, Mean RAD noted in our patients with successful outcome versus maturation failure was 2.33 ± 0.28 and 1.91 ± 0.31 mm also statistically significant when compared using independent *t*-test ($P < 0.00$). Thus the study concludes that, the vascular

calcifications were associated with high risk of maturation failure in diabetics. Hence, the proximal fistulas should be considered in diabetic patients with inadequate arterial diameter and calcifications.

Kochanek MA, et.al, (2018) conducted a prospective study on Aspirin use may associate with successful outcomes after percutaneous transluminal angioplasty (PTA) of hemodialysis (HD) fistulas and grafts at Texas in USA. About 80 hemodialysis patients underwent PTA for venous stenosis both in arteriovenous fistulas or grafts. In that 56 patients (66.1%) who had a successful outcome were aspirin user vs 24 patients (33.3%) who did not have a successful outcome were significantly more likely to have high venous pressure as the indication for PTA. The investigators found that a significant difference between the groups and defined as a success outcome is a dialyzer blood flow rate of 450 mL/min during dialysis without prolonged bleeding, cannulation pain, high venous pressure, low arterial pressure, pulling clots, infiltrations, poor clearance, infections, or swelling of the arm, neck, or head.

Mingzheng Aaron Goh, et.al, (2016) conducted a retrospective study on outcomes of arterio venous fistula in patients older than 70 years in Addenbrooke's Hospital, United Kingdom. The aim of the study is to report outcomes using an approach predominantly at creating radio-cephalic (RC) fistulas. In that, they were selected 204 radio-cephalic (RC), 1 brachio-basilic and 9 brachio-cephalic (BC) patients requiring for dialysis. The study analysed that BC fistula (10%) was associated using Fisher's exact text with a significantly ($P = 0.009$) higher incidence of steal syndrome than an RC fistula (2%). Thus, the study concludes that the radio-

cephalic fistulas formed in the elderly carry a lower risk of steal syndrome than brachio-cephalic fistulas.

Maria Teresa Parisotto (2014) Conducted a cross sectional survey on cannulation technique influence arteriovenous fistula and graft survival. The study investigated impact of cannulation technique on arteriovenous fistula and graft survival among 7058 out of 10,807 patients in 171 dialysis units located in Europe, the Middle East, and Africa to collect details on VA cannulation practice on a clinic by a clinic level. The study analysed 90.6% had an arteriovenous fistula and 9.4% arteriovenous graft with needling access by area technique for 65.8%, rope-ladder for 28.2% and buttonhole for 6%. Then analysis performed with SAS V9.2 at a significant *P*-value of 0.1. The retrograde direction of arterial needle with bevel down is associated with the least favourable outcome leads to higher risk of aneurism. Hence, the study concludes that the ante grade puncturing (43.1%) is considered as most common direction of puncture for fistula-protective and tract closure through flow force.

Carrie A. Schinstock (2011) conducted a retrospective study on outcomes of Arterio Venous Fistula creation after the fistula first initiative, Mayo Clinic, United States. Among 293 individual patients, 317 AVFs were placed to improve function or patency or to treat a complication during follow-up at Mayo Clinic, United States. Kaplan–Meier survival analysis and Cox proportional hazard models were used to calculate primary and secondary patency rates, and the log-rank test was used to compare patency rates. Analyses were performed using SAS 9.1. Primary failure remains a major issue in the post–Fistula First era. Hence, he found that artery size was the only predictor of both primary and secondary

patency. Spearman and Pearson correlation coefficients were obtained for all potential predictor variables to look for confounding. A univariate analysis was done with variables considered relevant to AVF patency. All variables with a *P* value <0.05 were included in the Multivariate Cox proportional hazards models to determine factors associated with reduced AVF patency. Test results were presented as hazard ratios (HR) with 95% confidence intervals (CIs), and two-sided $P < 0.05$ was considered statistically significant.

III. STUDIES RELATED TO PAIN DURING ARTERIOVENOUS FISTULA PUNCTURE

Olvani Martins da Silva et.al, (2016) conducted a cross-sectional study on Pain during Arteriovenous Fistula Cannulation in Chronic Renal Patients on Hemodialysis. 70 individuals participated in the research and were assessed by the visual analogue scale. The study analysis that the use of VAS showed the presence of moderate pain in most patients and no association between pain and gender, treatment period and hemodialysis shifts were found. So, the study concluded that the need for pre-cannulation analgesia improves comfort during the procedure.

Crespo Montero R., Edtna Erca J., (2012) conducted an experimental study in Europe. The aims of this study were to evaluate the effect of needle bevel position on the degree of pain and damage to the skin covering the vein, in an arteriovenous fistula puncture, in haemodialysis patients. 48 patients with autologous arteriovenous fistula were studied. Puncture degree of pain perceived by analogue visual scale and a descriptive verbal scale. It is concluded that arteriovenous fistula puncture with the bevel facing downward significantly reduces

the degree of pain and the skin lesion at the point of puncture, without increasing the number of punctures.

Figueired.A.E. et.al, (2008) conducted a prospective study in Brazil to evaluate the pain among hemodialysis patient. The study revealed that patients with ESRD undergoing hemodialysis are repeatedly exposed to stress and pain from approximately 300 punctures per year through their Arterio Venous Fistula. Repeated Arterio Venous Fistula punctures lead to a considerable degree of pain due to caliber & length of the level of fistula needle. The study concluded that, the buttonhole technique caused a Mean degree of pain of 2.4 compared to using of conventional rope ladder technique 3.4.

IV. STUDIES RELATED TO EFFECTIVENESS OF COLD APPLICATION ON ARTERIO VENOUS FISTULA PUNCTURE PAIN

Divya Jain Pachori (2017) conducted a quasi-experimental study on Effectiveness of Cryotherapy on Pain during Puncture of Arteriovenous Fistula among the Patients on Haemodialysis in selected hospitals, Gujrat. The sample size was 60 subjects (30 in Experimental and 30 in Control group) were selected by purposive sampling technique. Post-test only control group research design was used. Modified mc caffery's numeric pain rating scale was used for objective pain behaviour which includes facial expression, verbalization, body movement, interpersonal behaviourand physiology (Vital sign). The analysis of the data reveals that, the cryotherapy is highly significant in experimental group for reduction of pain during puncture of arteriovenous fistula among the patients on haemodialysis than control group.

Dipali Umesh Dumbre, (2016) carried out an experimental study on a study to assess the effectiveness of cryotherapy on pain during puncture of arteriovenous fistula among the patients on hemodialysis in selected Health Sciences hospitals, Pune, India. The samples of the study were 60 subjects (30 in Experimental and 30 in Control group) selected by a probability simple random sampling technique. Post-test only control group research design was used. The pain score was assessed by numerical pain rating scale and modified behavioral tool was used. The mean pain score by numerical rating scale in the experimental group was 4.07 + 1.46 and that of control group was 7 + 1.74 which is significant as $p< 0.0001$. The mean pain score by modified behavioural tool in experimental group was 2.30 + 1.78 and that of control group 5.60 + 1.92, which is significant as p value < 0.0001. So the study is concluded that cryotherapy is effective on pain during puncture of arteriovenous fistula among patients on haemodialysis.

Josel Lijiya, Loba Diana (2015) a Quasi-experimental time series study was conducted to evaluate the effectiveness of cryotherapy on arteriovenous fistula puncture related pain among hemodialysis patients in selected hospitals, Mangalore. By using purposive sampling technique 50 hemodialysis patients were selected and patients were randomly assigned to the experimental group (n_1=25) and control group (n_2=25) and data was collected using the demographic performa, numerical rating scale and observational checklist. There was a significant difference between the pre-test and post-test behavioural response scores and pain scores in the experimental group. The calculated ANOVA value (F=54.7) and (F=30.4) was significantly more than the tabled value ($F_{2,72)}$=3.15) at 0.05 level The current study

concluded that cryotherapy was effective in reducing subjective pain and objective behavioural response scores of arteriovenous fistula puncture related pain.

Vipinpatidar (2015) did the study on effectiveness of Cryotherapy on pain during arteriovenous fistula puncture among hemodialysis patients, in selected hospitals of pune. A quantitative pre-experimental research design was used. 60 samples were selected by non - probability purposive sampling. Wilcoxon test (Z) was used for comparison of the subjective pain level before and after the Cryotherapy. Results revealed that an average subjective assessment of pain before Cryotherapy was 4.01 which decreased to 2.98 after Cryotherapy and an average objective assessment of pain before Cryotherapy was 3.71 which decreased to 2.66 after Cryotherapy. This indicates that the Cryotherapy is significantly effective in improving the level of pain among patients undergoing Haemodialysis with arteriovenous fistula.

Alwin Issac and Praveen Namboothri (2015) conducted a true-experimental study on effect of cryotherapy on ArterioVenous Fistula puncture pain among patients on haemodialysis in Sanjay Gandhi Post-Graduate Institute of Medical Sciences hospital, Trichy, Tamilnadu. Post-test only control group design was adopted for this study. Sixty patients were recruited by simple random sampling method. Experimental group (n=30) received cryotherapy for 8 minutes in contra-lateral arm and Control group (n=30) no intervention. ArterioVenous Fistula puncture pain was assessed by numerical pain scale. The findings revealed that the post test mean score ArterioVenous Fistula puncture pain was 2.63 ± 1.27 in the experimental group and 7.06 ± 1.28 in the control group. The calculated t-value 13.48 was significant at P=0.001. The study concluded that the level of

ArterioVenous Fistula puncture pain among patients on hemodialysis was reduced after receiving cryotherapy.

Manal E.Fareed, et.al, (2014) carried out an experimental study to examine the effect of cutaneous stimulation on pain relieving at arteriovenous fistula puncture site among hemodialysis patients. Randomly selected samples of fourty hemodialysis patients in Shebin El- Kom teaching hospital and twelve hemodialysis patients in Menoufia University hospital, Egypt who had arteriovenous fistula were divided. Three tools were utilized to collect the data, an interviewing questionnaire to assess sociodemographic and medical data, Abbey pain scale to assess objective pain behaviour and 0-10 numeric pain scale to assess subjective pain were used. Cutaneous stimulation is effective in reducing arteriovenous fistula puncture objective and subjective pain scores among hemodialysis patients. Hence, the result was found in the first tool 0.89, second tool 0.87 and third tool 0.94.

Girish Nair (2013) conducted an experimental study to assess the effectiveness of local refrigeration prior to AV fistula puncture on pain related responses among haemodialysis patients in N.U. Hospital, Bengaluru. Post-test Only design was used in this study among the samples of 80 patients, divided into 40 subjects each will be allocated for experimental group and control group of haemodialysis patients. The tool in this study was using subjective numerical rating scale and observational checklist to evaluate the pain related responses. The result of the study shows that the local refrigeration prior to AV fistula is effective on pain related responses among hemodialysis patients.

Shali G.S (2012) conducted an experimental study on outcome of cryotherapy on arteriovenous fistula puncture site pain among patient on hemodialysis in vijaya health care centre, Vadapalani, Chennai. A randomized control trial used on 60 patients. It found to be significant (P=0.001) in reducing the arteriovenous fistula puncture site pain. This study concludes that the cryotherapy is used for effective pain management.

Sabitha.P.B, et.al, (2008) conducted an experimental study to find out the effect of cryotherapy on arteriovenous fistula puncture-related pain in hemodialysis patients in All India Institute of Medical Sciences Hospital, New Delhi. The main aim of the study was to find out the comparition of day 1 and day 2 pain score in the two groups. A convenience sampling technique was used among 60 patients (30 each in experimental and control groups). The tool used was questionnaire for collecting demographic and clinical data, an observation checklist for assessing objective pain behaviours, and a Numerical rating scale for subjective pain assessment. Then the comparison between day 1 and day 2 pain score within the control group revealed no significant differences in the objective (P=0.23) or subjective (P=0.89). This proves that there is no significant variation in the pain score of these two different AV fistula-puncturing procedures in the same individual. Thus the study concludes that the cryotherapy is effective in reducing arteriovenous fistula punctures pain of hemodialysis patients.

SUMMARY

This chapter dealt with literature related to the Patients, arteriovenous fistula cannulation, Pain, and Effectiveness of cold application on arteriovenous fistula puncture pain during cannulation. The literature review helped the investigator to become aware of the various methodologies used in cold application related studies. It helped the investigator to state the problem clearly, establish the need for the study, develop a conceptual frame work, develop the tool and achieve the objectives of the study.

CHAPTER – III

METHODOLOGY

"As a stand-alone discipline, research methodology is a body of knowledge, concepts, theories, and tools relating to how social and natural systems and entities can be studied. It is concerned with how research questions are framed, essential data is gathered, processed, analysed, interpreted, visualised and managed" **(BK Daniel, 2018)**

"Research Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge" **(Vishnu S Warrier, 2017)**

"Methods refer to the processes by which data are collected in the research study. A research publication should have a methods and section that outlines these processes" **(Singh, 2016)**

METHODOLOGY FOR THE PRESENT STUDY INVOLVE:-

Description of the research approach, research design, study setting, target population, sample and sampling technique, selection criteria, selection and development of instrument, content validity and reliability, pilot study, data collection process and plan for data analysis.

RESEARCH APPROACH

"Research based on traditional scientific methods, which generates numerical data and usually seeks to establish causal relationships between two or more variables, using statistical methods to test the strength and significance of the relationships". **(Nursing Dictionary, 2018)**

"Quantitative research is a structured way of collecting and analyzing data obtained from different sources. Quantitative research involves the use of computational, statistical, and mathematical tools to derive results. It is conclusive in its purpose as it tries to quantify the problem and understand how prevalent it is by looking for projectable results to a larger population". **(Sis International Research, 2018)**

Quantitative evaluative approach was used to assess the effectiveness of cold application on AV fistula punctures pain reduction among heamodialysis patients.

RESEARCH DESIGN

"Experimental research design is a method used to establish a cause and effect relationship between two variables or among a group of variables. The independent variable is manipulated to observe the effect on the depended variable." **(Muhammad Yousaf**, **2018)**

In this study, quasi experimental research design was used. The present study was intended to identify the effect of cold application on AV fistula punctures pain in hemodialysis patients. The research design adopted for this study is Non-

randomized control group post-test only design. Experiments are the powerful tool for testing hypothesis of cause and effect relationship between variables.

In the present study, the investigator manipulates the dependent variable by administering cold application to some subjects and withholding it from other subjects. The investigator thus consciously varies the independent variable and observes the effect on the dependent variable. Manipulation and control was used in the study. These are the characteristics of quasi experimental design. Hence, quasi experimental design is used for the present study.

$$\mathbf{E_1 \quad X \quad O_1}$$

$$\mathbf{C_1 \quad - \quad O_2}$$

$$\mathbf{E = O_1 - O_2}$$

The symbol explained as follows.

- ♠ E_1: Experimental group.
- ♠ C_1: Control group
- ♠ X: Administration of cold application.
- ♠ O_1: Post test assessment of pain during AV fistula cannulation after administration of cold application among hemodialysis patients in the experimental group.
- ♠ O_2: Post test assessment of pain during AV fistula cannulation among hemodialysis patients in the control group without any intervention.
- ♠ E: Effectiveness of cold application on pain reduction during AV fistula cannulation.

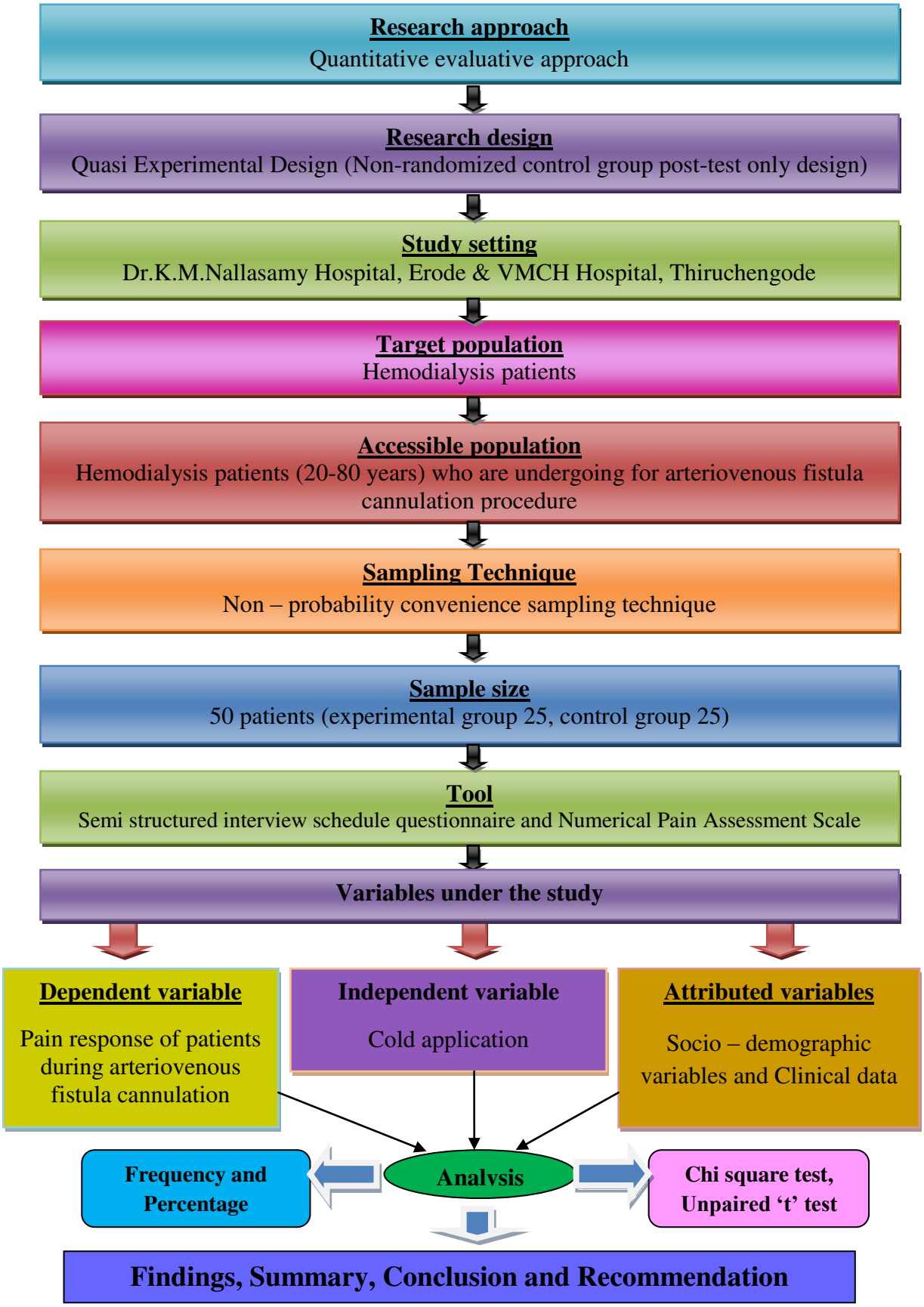

FIGURE 3.1 SCHEMATIC REPRESENTATION OF THE RESEARCH METHODOLOGY

VARIABLES UNDER STUDY

Variable

"Variables can be defined as any aspect of a theory that can vary or change as part of the interaction within the theory. In other words, variables are anything can effect or change the results of a study. Every study has variables as these are needed in order to understand differences". **(Dr. Christopher L. Heffner, 2014)**

Independent variable

In the present study, the independent variable was cold application.

Dependent variable

In this study, the dependent variable refers to the pain score of arterionvenous fistula puncture pain among haemodialysis patients.

Attributed variables

In the present study, Attributed variables are the characteristics of the subjects that are collected to describe the samples. They are socio-demographic variables and clinical data such as age, gender, religion, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits, recreational activities during dialysis procedure, clinical causes for undergoing haemodialysis procedure, co – morbid conditions, duration of illness, previous history of kidney transplantation, period of haemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, time duration

of haemodialysis procedure, frequency of attending dialysis in a week, number of dialysis per month, amount of fluid clearance, patient weight in kilograms, techniques of arteriovenous cannulation, size of arteriovenous cannula used, and complications of arteriovenous fistula.

STUDY SETTING

"The research setting can be seen as the physical, social, and cultural site in which the researcher conducts the study". **(Lisa M. Given, 2008)**

The present study was conducted in the dialysis department of Dr.K.M.Nallasamy (250 bedded) hospital, Erode, situated at a distance of 20 kms from Vivekanadha College of Nursing. This dialysis unit is running with 40 patients per day. It has facilitated with various departments like Nephrology OPD, Ortho OPD, Emergency unit, Intensive Care Unit and wards. Also, conducted in Vivekanadha Medical Care Hospital (306 bedded) hospital, Thiruchengode. It has facilitated with various departments like medical, surgical, orthopedic, opthalmology, urology, obstetrics & gyenacology, cardio-thoracic, paediatric. It has both private and common wards for all departments. It has fully equiped OT, ICU, CCU, CTU, dialysis unit and Emergency department.

TARGET POPULATION

"The target population which is also called the universe is composed of the entire group of people or objects to which the researcher wishes to generalize the findings of the study. The target population consists of people or things that meet the designed set of criteria of interest to the researcher". **(Firoz qureshi, 2016)**

The target population of the study was patients with arteriovenous fistula punctures pain who were attending hemodialysis in Dr.K.M.Nallasamy hospital and Vivekanandha Medical Care Hospital.

ACCESSIBLE POPULATION

"The accessible population refers to the aggregate of cases which confirm to the designed criteria as which is accessible to the researcher as the pool of the subjects or objects" **(Firoz qureshi, 2016)**

The accessible population of the study was patients with hemodialysis patients (20-80 years) who are undergoing for arteriovenous fistula cannulation procedure.

SAMPLE

"A sample is a subset of a population that is used to represent the entire group as a whole. When doing research, it is often impractical to survey every member of a particular population because the sheer number of people is simply too large". **(Kendra Cherry**, **2018)**

Sample for this study comprised of Haemodialysis patients who are coming to Dr.K.M.Nallasamy hospital, Erode and Vivekanandha Medical Care Hospital, Thiruchengode.

SAMPLE SIZE

"Sampling is the selection of a subset of individuals from within a statistical population to estimate characteristics of the whole population". **(Lance, P. & Hattori, A., 2016)**

The total sample size was 50 and each 25 were assigned to Experimental and Control group.

SAMPLING TECHNIQUE

"Sampling techniques are the strategies applied by researchers during the statistical sampling process". **(Natalie Boyd, 2018)**

"Non-probability sampling is a sampling technique in which the researcher selects samples based on the subjective judgment of the researcher rather than random selection. In non-probability sampling, not all members of the population have a chance of participating in the study unlike probability sampling, where each member of the population has a known chance of being selected".

"Convenience sampling is a non-probability sampling technique where samples are selected from the population only because they are conveniently available to researcher. These samples are selected only because they are easy to recruit and researcher did not consider selecting sample that represents the entire population" **(Adi Bhat, 2018)**

Haemodialysis patients with arteriovenous fistula punctures Pain were taken as samples for the study. Samples were selected with the help of Non-probability convenience sampling technique by assessing the pain score. The study sample consists of 50 patients, conveniently assigned 25 patients as control group and other 25 patients as experimental group, who were undergoing haemodialysis at Dr.K.M.Nallasamy hospital, Erode and Vivekanandha Medical Care Hospital, Thiruchengode. Samples were both males and females, who met the inclusive

criteria were selected through convenient sampling. The investigator visited the dialysis unit for about five weeks regularly. An average of 50 patients, after getting consent, was interviewed using the semi-structured interview schedule.

CRITERIA FOR SELECTION OF SAMPLES

Inclusion Criteria

1. Patients who are able to comprehend haemodialysis procedure.
2. Patients having native arteriovenous fistula.
3. Both male and female patients.
4. Patients having arteriovenous fistula at any of their arms.

Exclusion Criteria

1. Patients who are unwilling to participate in the study.
2. Patients who are seriously ill.
3. Patients associated with other disease condition.
4. Patients are admitted with any surgical conditions.

SELECTION OF TOOL

"Anything that becomes a means of collecting information for your study is called a research tool or a research instrument. For example, observation forms, interview schedules, questionnaires, and interview guides are all classified as research tools" **(Vipin Patidar 2015)**

Semi structured interview schedule and Numerical Pain Assessment Scale was used to assess the effectiveness of cold application on arteriovenous fistula puncture pain during cannulation in haemodialysis patients.

DEVELOPMENT OF TOOL

The following steps were carried out in preparing the tool

- Literature review
  - Literature from the books, journals, periodicals, published and unpublished studies were reviewed and used to develop the tool.
- Experts opinion
  - The content was given to the experts in various fields like Nephrologist, Urologist, Medical – Surgical Nursing experts and Statistician. Their opinion and suggestions were taken to modify the content. The research consultant and guide were consulted when finalizing the tool.

DESCRIPTION OF THE TOOL

Semi structured interview schedule and Numerical Pain Assessment Scale was prepared to assess the pain of heamodialysis patients during arteriovenous fistula cannulation.

Section A: Interview schedule for collecting Socio- demographic variables data:

It consists of 10 items including age, gender, religion, educational status, occupational status, marital status, type of family, and duration of sleep at night

time, dietary pattern, personal habits, and recreational activities during dialysis procedure.

Section B: Interview schedule for collecting Clinical data:

It consists of 16 items including Clinical causes for undergoing haemodialysis procedure, co – morbid conditions, duration of illness, previous history of kidney transplantation, period of haemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, time duration of haemodialysis procedure, frequency of attending dialysis in a week, number of dialysis per month, amount of fluid clearance, patient weight in kilograms, techniques of arteriovenous cannulation, size of arteriovenous cannula used and complications of arteriovenous fistula.

Section C: Numerical Pain Rating Scale

It is the Numerical Pain Assessment Scale to assess pain intensity. It is one of the standardized tools for quantifying pain intensity which consist of a scale with values ranging from zero to ten. On this scale 0 means no pain, 1-3 means mild pain, 4-6 means moderate pain and 7- 9 severe pain, 10 means worst pain. Patients marked a tick on the scale to indicate how strong their pain during arteriovenous fistula punctures

SCORING PROCEDURE

Numerical pain assessment scale which includes 5 items with a total score of 10. On this scale 0 means no pain, 1-3 means mild pain, 4-6 means moderate pain and 7- 9 severe pain, 10 means worst pain.

Table 3.1 Scoring of Numerical Pain Assessment Scale

Level of pain	Percentage of score	Actual score
No pain	0	0
Mild pain	10 – 30	1-3
Moderate pain	40 – 60	4-6
Severe pain	70 – 90	7-9
Worst pain	100	10

Preparation of the final draft

The final draft of the Numerical Pain Assessment Scale was prepared after testing the reliability and validity.

RELIABILITY OF THE TOOL

"Reliability is the degree of consistency of a measure. A test will be reliable when it gives the same repeated result under the same conditions" **(Martyn Shuttleworth, Lyndsay T Wilson, 2018)**

The reliability of the Numerical Pain Assessment Scale was tested for the patients during arteriovenous fistula cannulation. Inter-rater reliability where Kaul Pearson's correlation formula was used to find out the reliability for the Numerical Pain Assessment Scale ($r = 0.93$).

VALIDITY OF THE TOOL

Validity refers to the degree to which an instrument measures what it suppose to measure. **(Polit and Beck, 2011)**

The tool will be established by the expert from various fields such as nephrologist-1, urologist-1, biostatistician-1, nursing experts-4. Their opinions and suggestion will be considered for the modification of tool. The research guide and co-guide also will be consulted before finalizing the tool.

PILOT STUDY

"A pilot study is a standard scientific tool for 'soft' research, allowing scientists to conduct a preliminary analysis before committing to a full-blown study or experiment" **(Martyn Shuttleworth, 2018)**

After obtaining permission from the concerned authority, the pilot study was conducted in the month of March 2018 at Kalyani Kidney Care Hospital, Erode. 10 patients were selected by Non-probability convenient sampling technique. 5 were in experimental group and 5 were in control group. The purpose of the pilot study was to evaluate the effectiveness of cold application on pain response during arteriovenous fistula cannulation among hemodialysis patients, to find out the feasibility of conducting the final study and to determine the method of statistical analysis. Cold application was administrated to the patients in the experimental group before and during arteriovenous fistula cannulation and withhold from the control group, then the pain response was assessed with Numerical Pain Assessment Scale in experimental and control groups. The mean pain score in the control group

were higher than the mean pain scores in the experimental group. The results of the data revealed that the tool was feasible to conduct the study.

DATA COLLECTION PROCEDURE

1. Ethical consideration.

Prior to the collection of the data, written permission were obtained from the Chief Medical Officer of Dr.K.M.Nallasamy hospital, Erode. The patients were assigned that anonymity of each individual would be maintained and informed consent was obtained from them.

2. Period of data collection.

The period of data collection was done from 01.03.2018 to 30.03.2018 in the dialysis unit of Dr.K.M.Nallasamy hospital, Erode and from 01.04.2018 to 30.04.2018 in the dialysis unit of Vivekanadha Medical Care Hospital, Thiruchengode.

3. Post test in the control group.

Post test score of pain among 25 patients in the control group were assessed with Numerical Pain Assessment Scale without administering cold application.

4. Administration of cold application to the patients in the experimental group.

An ice cube of 5*5 centimeters, with in a glove, covered with a gauze and applied on the site between the thumb and index finger on the contra lateral hand of

arteriovenous fistula, for a period of 10 minutes prior to arteriovenous fistula cannulation were applied to 25 patients in the experimental group.

5. Evaluation of effectiveness of cold application.

Effectiveness of local cold application was evaluated by assessing the pain score of patients in the experimental group during arteriovenous fistula cannulation with Numerical Pain Assessment Scale.

PLAN FOR DATA ANALYSIS

The obtained data were analyzed on the basis of the objectives of the study by using descriptive and inferential statistics. The plan for data analysis as follows.

- Data were organized in master sheet.
- The frequencies and percentage of the analysis of Socio demographic variables like age, gender, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits, and recreational activities during dialysis procedure. Clinical data like reason for undergoing haemodialysis procedure, co – morbid conditions, duration of illness, previous history of kidney transplantation, period of haemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, time duration of haemodialysis procedure, frequency of attending dialysis in a week, number of dialysis per month, amount of fluid clearance, patient weight in kilograms, techniques of arteriovenous cannulation, size of

arteriovenous cannula used, complications of arteriovenous fistula were presented in table and graph.

- ❖ Maximum score, standard deviation, mean score, range score, mean percentage and mean difference of experimental and control group were analyzed and presented in table.
- ❖ Unpaired‘t’ test is used to compare the pain score during arteriovenous cannula insertion between experimental and control group and presented in table.
- ❖ Inferential statistics especially chi-square test is used to find out the association between post-test score of pain response in the experimental group with socio demographic variables and selected clinical data findings were showed in tables and graphs.

SUMMARY

This chapter included the description of research approach, research design, study setting, target population, sampling techniques, selection criteria for the samples, development and description of the tool, content validity, and reliability of the instrument, pilot study, data collection procedure and plan for data analysis.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

"Statistical analysis is a component of data analytics. This statistical analysis involves collecting and scrutinizing every data sample in a set of items from which samples can be drawn. A sample, in statistics, is a representative selection drawn from a total population" **(Dr. Amanda J Rockinson- Szapkiw, 2014)**

"Data analysis is the method or methods that can be used to analyze data and the process of analyzing it. **Data Analysis** is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data" **(Steven Dillard, 2015)**

"The process of evaluating data using analytical and logical reasoning to examine each component of the data provided. This form of analysis is just one of the many steps that must be completed when conducting a research experiment. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion. There are variety of specific data analysis method, some of which include data mining, text analytics, business intelligence, and data visualizations" **(Business Dictionary, 2018)**

This chapter deals with analysis and interpretation of quantitative data collected from a sample of 50 hemodialysis patients (20-80 years) to find out the effectiveness of cold application on arteriovenous fistula puncture pain during arteriovenous cannulation admitted in Dr. K. M. Nallasamy Hospital, Erode.

The data which are necessary to provide the adequacy of the study were collected through semi-structured interview schedule questionnaire and analyzed using relevant descriptive and inferential statistics. The substantive summary of the findings were arranged in line with objectives of this study.

STATEMENT OF THE PROBLEM

"A study to assess the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients at Erode and Namakkal District".

OBJECTIVES

- To assess the arteriovenous fistula puncture pain among haemodialysis patients in Experimental and Control group.
- To compare the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients between experimental and control group.
- To find out the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in Experimental and Control group.
- To find out the post-test score of arteriovenous fistula puncture pain with selected Clinical data in Experimental and Control group.

PRESENTATION OF THE DATA

SECTION I:

- Distribution of Socio-demographic variables among hemodialysis patients in experimental and control group undergoing arteriovenous fistula cannulation.

- Distribution of selected Clinical data among hemodialysis patients in experimental and control group undergoing arteriovenous fistula cannulation.

SECTION II:

- Distribution of post-test score of arteriovenous fistula puncture pain among hemodialysis patients in experimental and control group.

SECTION III:

- Effectiveness of cold application on arteriovenous fistula puncture pain among hemodialysis patients.

SECTION IV:

- Association between the post-test scores of pain among hemodialysis patients in the experimental group with Socio-demographic variables.
- Association between the post-test scores of pain among hemodialysis patients in the experimental group with selected Clinical data.

SECTION V:

- Association between the post-test scores of pain among hemodialysis patients in the control group with Socio-demographic variables.
- Association between the post-test scores of pain among hemodialysis patients in the control group with selected Clinical data.

SECTION I

TABLE 4.1.1 DISTRIBUTION OF SOCIO-DEMOGRAPHIC VARIABLES AMONG HEMODIALYSIS PATIENTS IN EXPERIMENTAL AND CONTROL GROUP UNDERGOING ARTERIOVENOUS FISTULA CANNULATION

(N=50)

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
1.	**Age**						
	20 – 40 years	8	32%	7	28%	15	30%
	41 – 60 years	12	48%	13	52%	25	50%
	61 – 80 years	5	20%	5	20%	10	20%
2.	**Gender**						
	Male	12	48%	19	76%	31	62%
	Female	13	52%	6	24%	19	38%
3.	**Educational Status**						
	Illiterate	7	28%	7	28%	14	28%
	Primary education	14	56%	9	36%	23	46%
	Secondary education	2	8%	4	16%	6	12%
	Higher secondary	0	0%	1	4%	1	2%
	Diploma	0	0%	0	0%	0	0%
	Upper graduate	2	8%	2	8%	4	8%
	Post graduate	0	0%	2	8%	2	4%

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
4.	**Occupational status**						
	Government employee	0	0%	1	4%	1	2%
	Private employee	2	8%	1	4%	3	6%
	Business	5	20%	3	12%	8	16%
	Daily wage	1	4%	2	8%	3	6%
	Unemployed	17	68%	18	72%	35	70%
5.	**Marital status**						
	Single	5	20%	1	4%	6	12%
	Married	20	80%	22	88%	42	84%
	Widow / Widower	0	0%	2	8%	2	4%
	Separated	0	0%	0	0%	0	0%
	Divorced	0	0%	0	0%	0	0%
6.	**Type of family**						
	Nuclear	24	96%	24	96%	48	96%
	Joint	0	0%	1	4%	1	2%
	Extended	1	4%	0	0%	1	2%
7.	**Duration of sleep at night time**						
	0 - 3 hrs	3	12%	3	12%	9	18%
	4 - 6 hrs	16	64%	18	72%	34	68%
	7 - 9 hrs	6	24%	4	16%	10	20%
	Above 10 hrs	0	0%	0	0%	0	0%
8.	**Dietary pattern**						
	Vegetarian	6	24%	5	20%	11	22%
	Non – vegetarian	19	76%	20	80%	39	78%

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
9.	**Personal habits**						
	Alcohol	0	0%	3	12%	3	6%
	Smoking	1	4%	1	4%	2	4%
	Chewing tobacco	1	4%	4	16%	5	10%
	Supari pan / Betal nut	2	8%	1	4%	3	6%
	Using harmful drugs	0	0%	0	0%	0	0%
	Multiple habits	7	28%	6	24%	13	26%
	No habits	14	56%	10	40%	24	48%
10.	**Recreational activities during dialysis**						
	Watching television	12	48%	21	84%	33	66%
	Listening music	2	8%	3	12%	5	10%
	Playing mobile games	0	0%	1	4%	1	2%
	Reading news paper	1	4%	0	0%	1	2%
	Reading books	10	40%	0	0%	10	20%

TABLE 4.1.2 DISTRIBUTION OF CLINICAL DATA AMONG HEMODIALYSIS PATIENTS IN EXPERIMENTAL AND CONTROL GROUP UNDERGOING ARTERIOVENOUS FISTULA CANNULATION

(N=50)

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
11.	**Clinical causes for undergoing hemodialysis procedure**						
	Chronic renal failure	24	96%	24	96%	48	96%
	Congenital diseases	1	4%	0	0%	1	2%
	Poisoning	0	0%	0	0%	0	0%
	Snake bite	0	0%	1	4%	1	2%
	Any other	0	0%	0	0%	0	0%
12.	**Co – morbid conditions**						
	Hypertension	11	44%	17	68%	28	56%
	Diabetes	2	8%	3	12%	5	10%
	Both HTN & DM	5	20%	1	4%	6	12%
	Nil	7	28%	4	16%	11	22%
13.	**Duration of illness**						
	Less than 1 year	2	8%	1	4%	3	6%
	1 – 3 years	9	36%	18	72%	27	54%
	3 – 5 years	7	28%	3	12%	10	20%
	More than 5 years	7	28%	3	12%	10	20%

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
15.	**Period of hemodialysis in months**						
	Less than 6 months	2	8%	1	4%	3	6%
	7 – 12 months	8	32%	5	20%	13	26%
	13 – 24 months	2	8%	8	32%	10	20%
	25 – 36 months	5	20%	7	28%	12	24%
	More than 37 months	8	32%	4	16%	12	24%
16.	**Presence ofarteriovenous fistula in an arm**						
	Right arm	4	16%	6	24%	10	20%
	Left arm	21	84%	19	76%	40	80%
17.	**Site of arteriovenous fistula**						
	Radio – cephalic	6	24%	3	12%	9	18%
	Brachio – cephalic	14	56%	8	32%	22	44%
	Brachio – basilic	5	20%	8	32%	13	26%
	Ulnar – basilica	0	0%	6	24%	6	12%
18.	**Duration of present arteriovenous fistula site use**						
	1 – 6 months	5	20%	2	8%	7	14%
	7 – 12 months	6	24%	4	16%	10	20%
	13 – 18 months	1	4%	4	16%	5	10%
	19 – 24 months	2	8%	6	24%	8	16%
	More than 25 months	11	44%	9	36%	20	40%

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
19.	**Time duration of hemodialysis procedure**						
	2 hours	1	4%	0	0%	1	2%
	4 hours	24	96%	25	100	49	98%
	6 hours	0	0%	0	0%	0	0%
21.	**Frequency of attending dialysis in a week**						
	Once	1	4%	3	12%	4	8%
	Twice	22	88%	20	80%	42	84%
	Thrice	2	8%	2	8%	4	8%
	Daily	0	0%	0	0%	0	0%
22.	**Amount of fluid clearance**						
	100 – 1000 ml	0	0%	1	4%	1	2%
	1001 – 2000 ml	1	4%	4	16%	5	10%
	2001 – 3000 ml	10	40%	6	24%	16	32%
	3001 – 4000 ml	12	48%	9	36%	21	42%
	4001 – 5000 ml	2	8%	5	20%	7	14%
23.	**Patient weight in kilograms**						
	Less than 40 kg	2	8%	0	0%	2	4%
	40 – 60 kg	14	56%	15	60%	29	58%
	61 – 80 kg	8	32%	8	32%	16	32%
	81 – 100 kg	1	4%	2	8%	3	6%
	101 – 120 kg	0	0%	0	0%	0	0%

Sl.No	Variables	Subjects				Total	
		Experimental Group (n=25)		Control Group (n=25)			
		No	%	No	%	No	%
24.	**Techniques of arteriovenous cannulation**						
	Area cannulation	14	56%	13	52%	27	54%
	Rope – ladder technique	0	0%	0	0%	0	0%
	Button – hole method	11	44%	2	48%	23	46%
25.	**Size of arteriovenous cannula used**						
	14 G (Yellow)	0	0%	0	0%	0	0%
	15 G (Blue)	0	0%	0	0%	0	0%
	16 G (Green)	25	100%	25	100%	50	100%
	17 G (Orange)	0	0%	0	0%	0	0%
26.	**Complications of arteriovenous fistula**						
	Thrombosis	0	0%	1	4%	1	2%
	Stenosis	0	0%	1	4%	1	2%
	Aneurysm	6	24%	3	12%	9	18%
	Infection	0	0%	0	0%	0	0%
	Nil	19	76%	20	80%	39	78%

Distribution of subjects according to Age

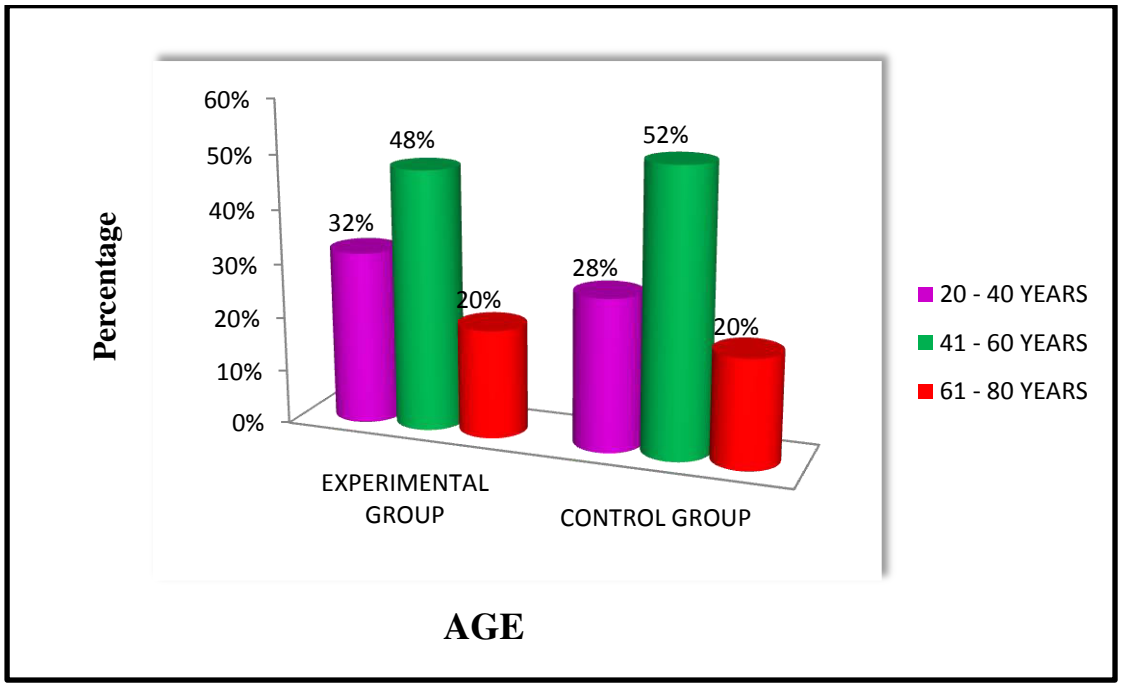

Figure 4.1.1 shows that among 25 samples half of them 12(48%) between the age group of 41 - 60 years in experimental group, whereas in control group half of them 13(52%) between the age group of 41 – 60 years.

Distribution of subjects according to Gender

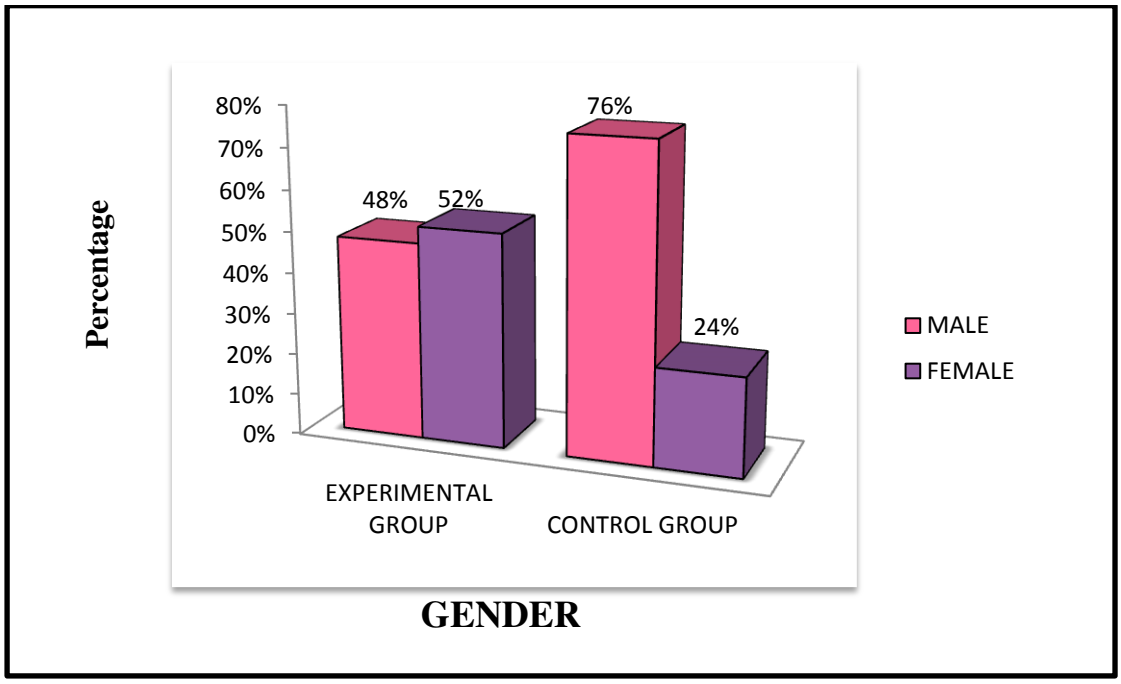

Figure 4.1.2 represents the gender, among 25 subjects in experimental group half of them were female 13 (52%), whereas in control group half of them were male 19(76%).

Distribution of subjects according to Educational Status

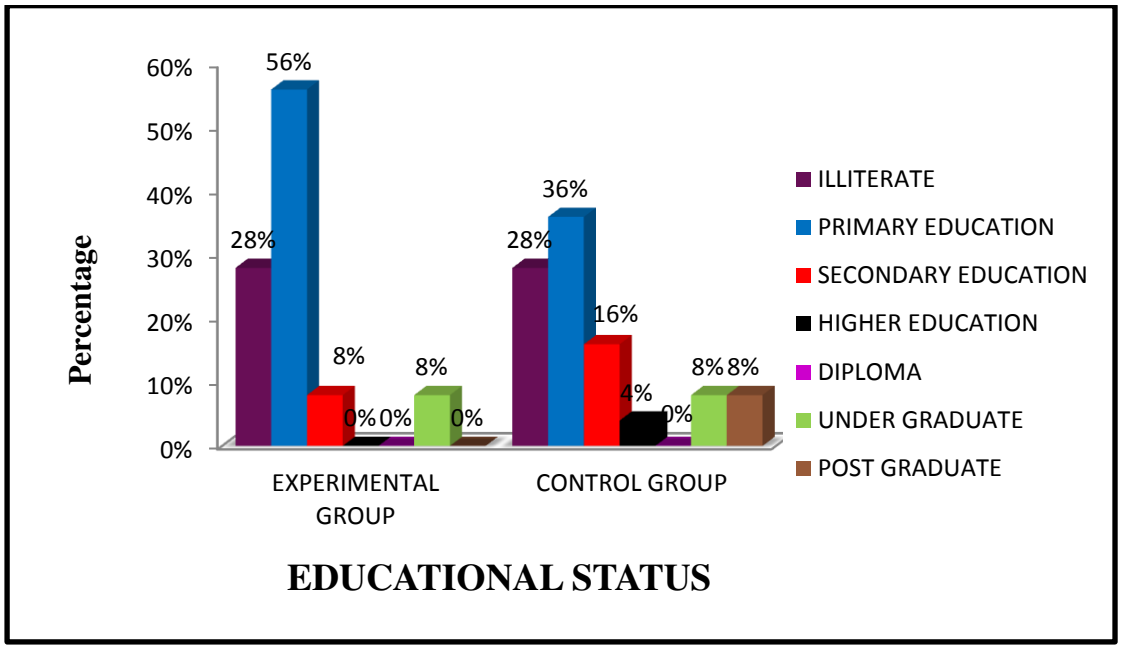

Figure 4.1.3 describes that among 25 subjects in experimental group, half of them 14(56%) had studied upto primary education, 7(28%) were illiterate, 2(8%) had studied upto secondary education and under graduate, none of them were studied upto higher education, diploma and post graduation. In addition to that, among 25 subjects in control group 9(36%) had studied upto primary education, 7(28%) were illiterate, 4(16%) had studied upto secondary education, 2(8%) had studied upto under graduate and post graduate, 1(4%) had studied higher education and none of them studied upto diploma.

Distribution of subjects according to Occupational Status

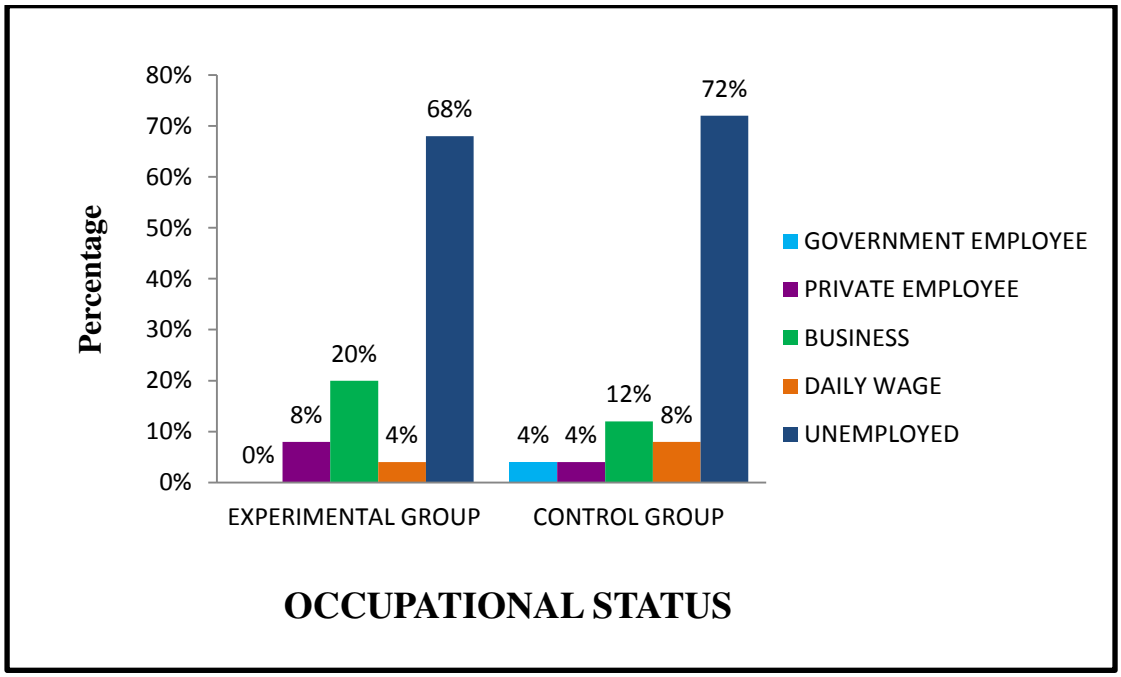

Figure 4.1.4 depicts that, 17(68%) of them were Unemployed, 5(20%) of them were doing Business, 2(8%) of them were worked as Private employee, 1(14%) of them worked based on Daily wages in experimental group. Furthermore, 18(72%) of them were Unemployed, 3(12%) of them were doing Business, 2 (8%) of them were worked based on Daily wage, 1(4%) of them were worked as private employee and another 1(4%) of them were worked as Government employee in control group.

Distribution of subjects according to Marital Status

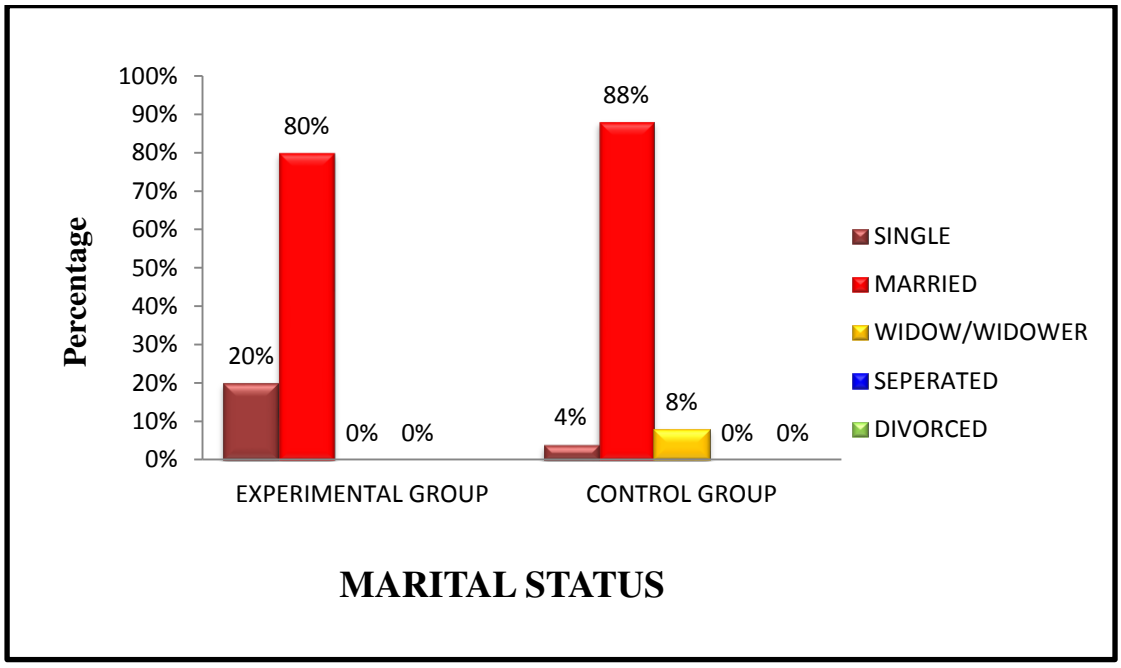

Figure 4.1.5 shows that among 25 subjects in experimental group, the majority 20(80%) of them were married whereas 5(20%) of them were single and none of them were widow/widower, seperated and divorced in the experimental group. In addition, among 25 subjects in control group, the majority 22(88%) of them were married, 2(8%) of them were widow, only 1(4%) of them were single and none of them were seperated and divorced in the control group.

Distribution of subjects according to the Type of Family

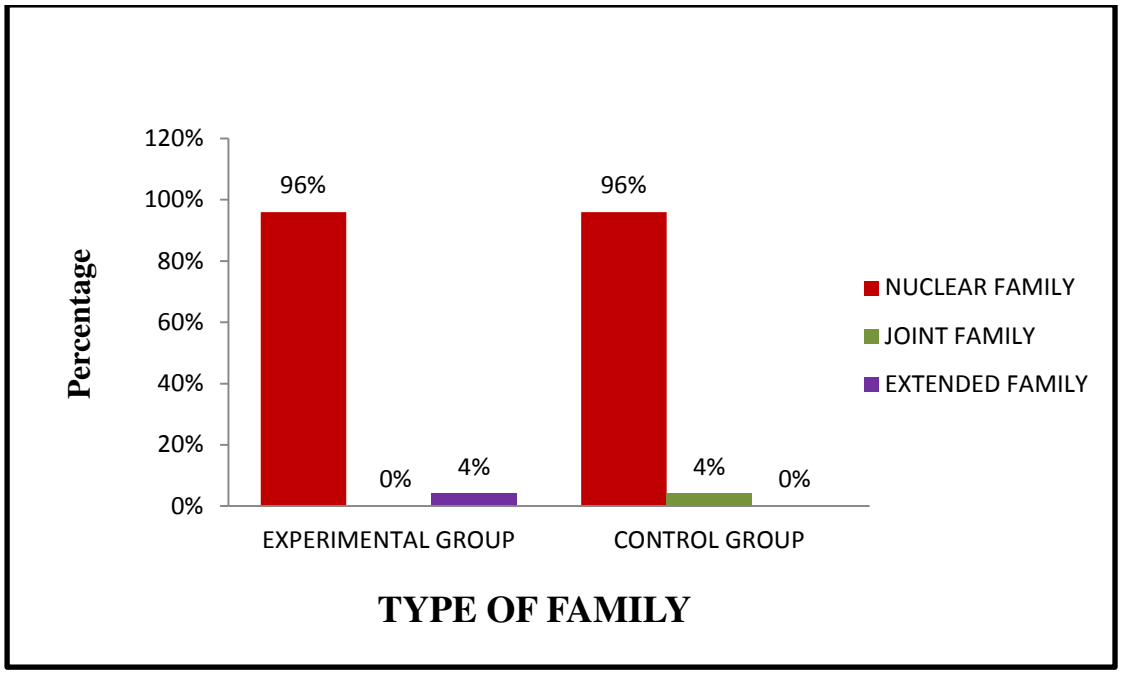

Figure 4.1.6 depicts the type of family, among 25 subjects in experimental group, majority 24(96%) belong to nuclear family, only 1(4%) belongs to extended family and None of them belong to joint family. In control group, 24(96%) belong to nuclear family, only 1(4%) belong to joint family and None of them belong to extended family.

Distribution of subjects according to Duration of sleep at night time

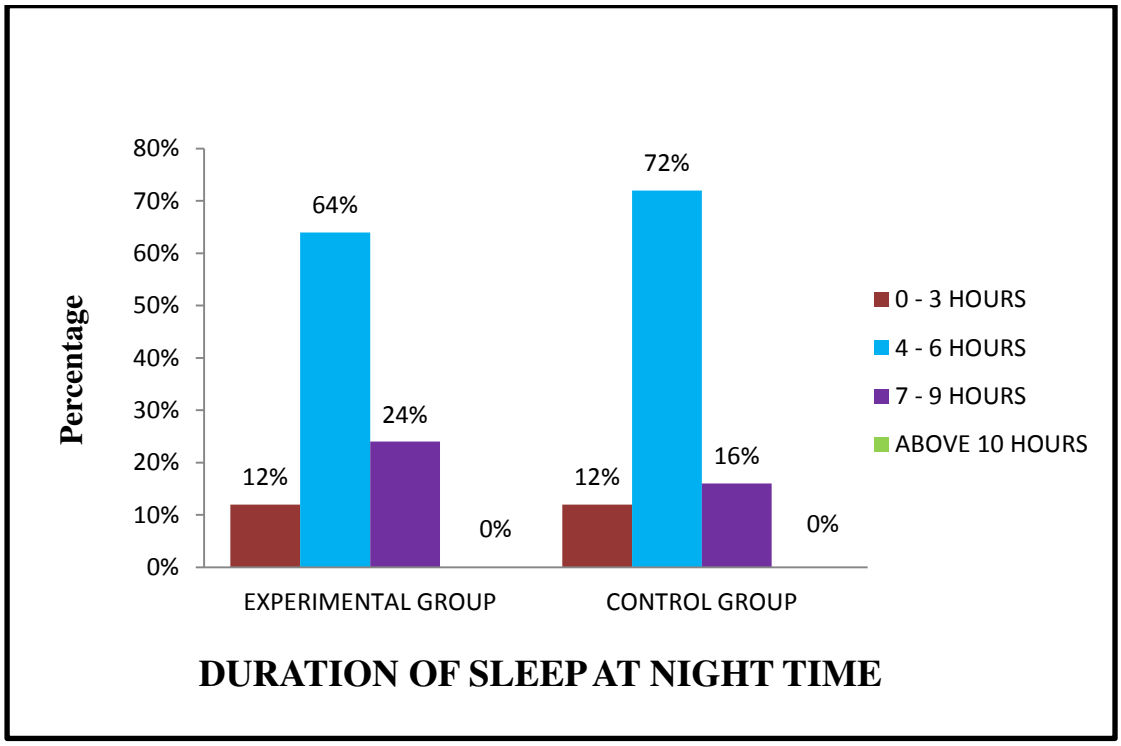

Figure 4.1.7 In experimental group, half of the subjects 16(64%) had sleep at night time between the duration of 4 – 6 hrs, whereas in control group half of the subjects 18(72%) had sleep at night time between the duration of 4 – 6 hrs.

Distribution of subjects according to Dietary pattern

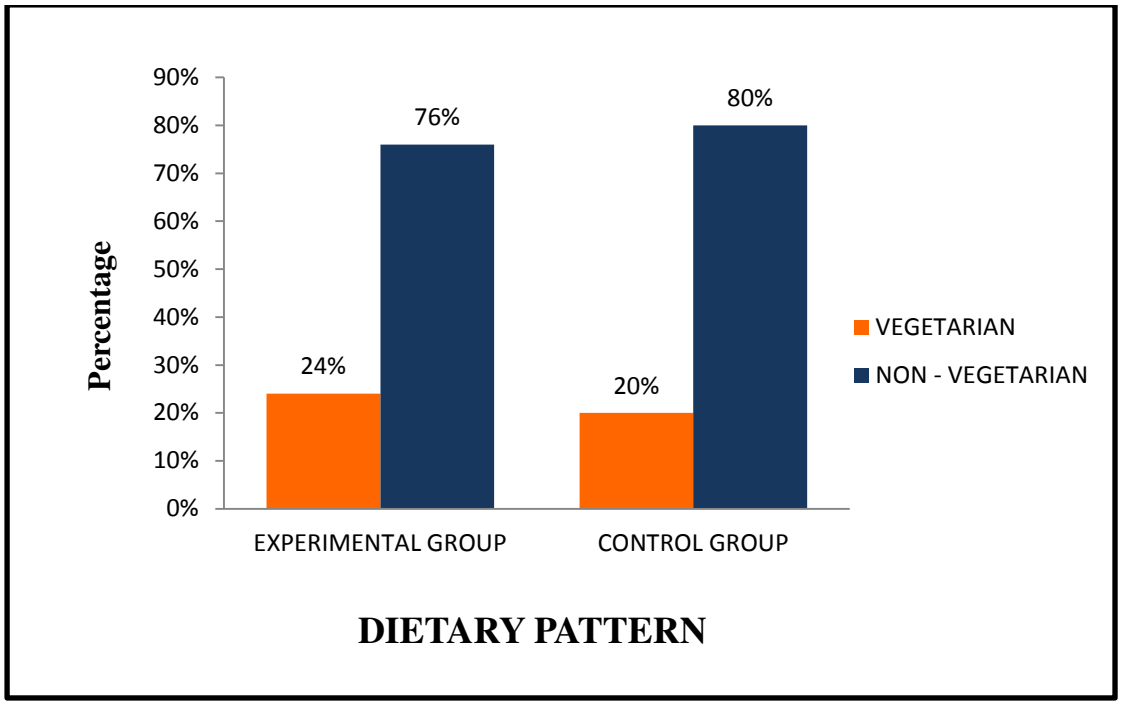

Figure 4.1.8 Concerning the dietary pattern among 25 subjects, half of them 19(76%) were followed non-vegetarian and remaining 6(24%) of them were followed vegetarian in experimental group. Whereas in control group, Most of them 20(80%) were followed non-vegetarian and remaining 5(20%) were followed vegetarian

Distribution of subjects according to personal habits

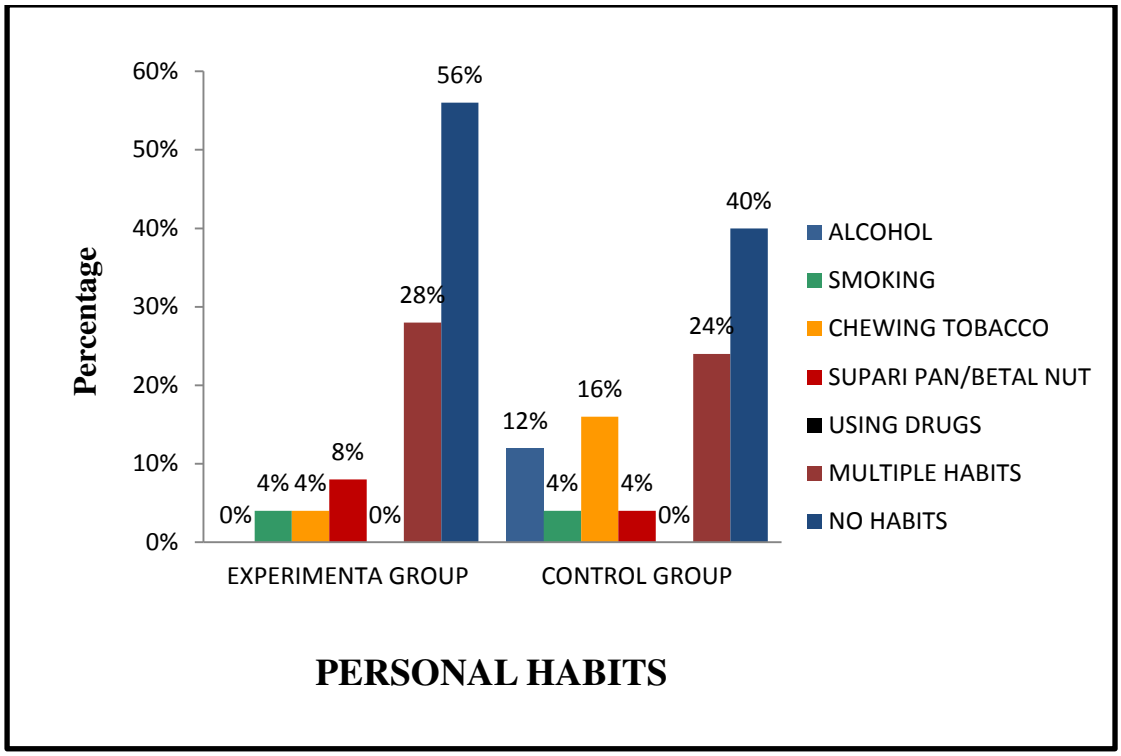

Figure 4.1.9 shows regarding the personal habits half of them14(56%) had no personal habits, 7(28%) of them had multiple habits, 2(8%) of them had habit of using supari pan/betal nut, 1(4%) of them had habit of smoking, only 1(4%) had habit of chewing tobacco and none of them consuming alcohol and using harmful drugs in the experimental group. Among 25 subjects 10(40%) of them had no personal habits, 6(24%) had multiple habits, 4(16%) of them had habit of chewing tobacco, 3(12%) of them consuming alcohol, 1(4%) of them had habit of smoking, another 1(4%) of them had habit of using supari pan/betal nut and none of them using harmful drugs in control group.

Distribution of subjects according to recreational activities during dialysis procedure

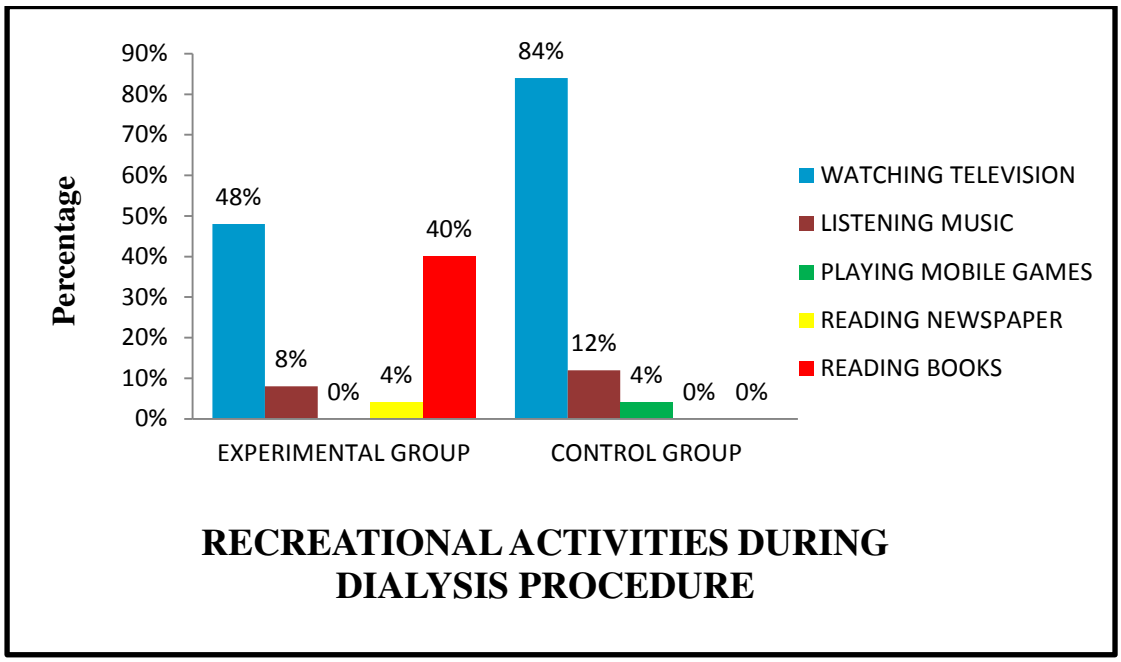

Figure 4.1.10 shows that among 25 samples in experimental group, half of them 12 (48%) were watching television, 10(40%) were reading books, 2(8%) were listening music, only 1(4%) reading newspaper and none of them were playing mobile games in the experimental group and among 25 samples in the control group, majority of them 21(84%) were watching television, 3(12%) were listening music, only 1(4%) were playing mobile games and none of them reading newspaper and books.

Distribution of subjects according Clinical causes for undergoing hemodialysis procedure

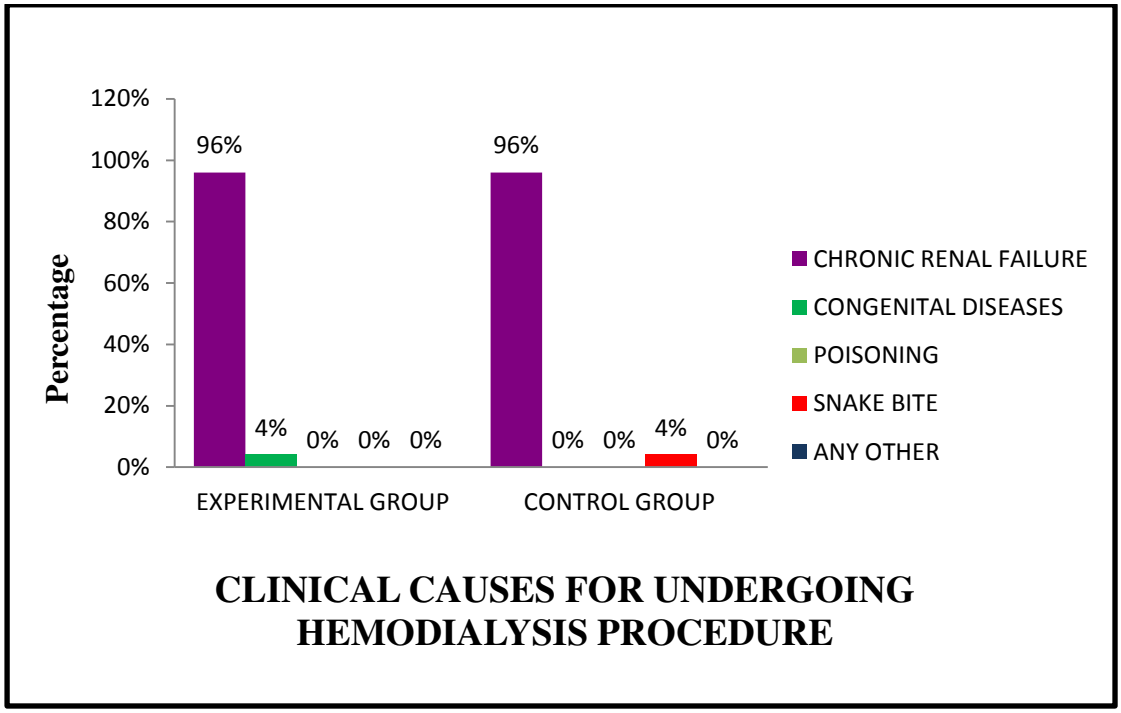

Figure 4.1.11 narrates that among 25 subjects, majority of them 24(96%) had chronic renal failure and only 1(4%) had congenital disease in the experimental group. Further more in control group, majority of them 24(96%) had chronic renal failure and only 1(4%) had snake bite.

Distribution of subjects according to Co – morbid conditions

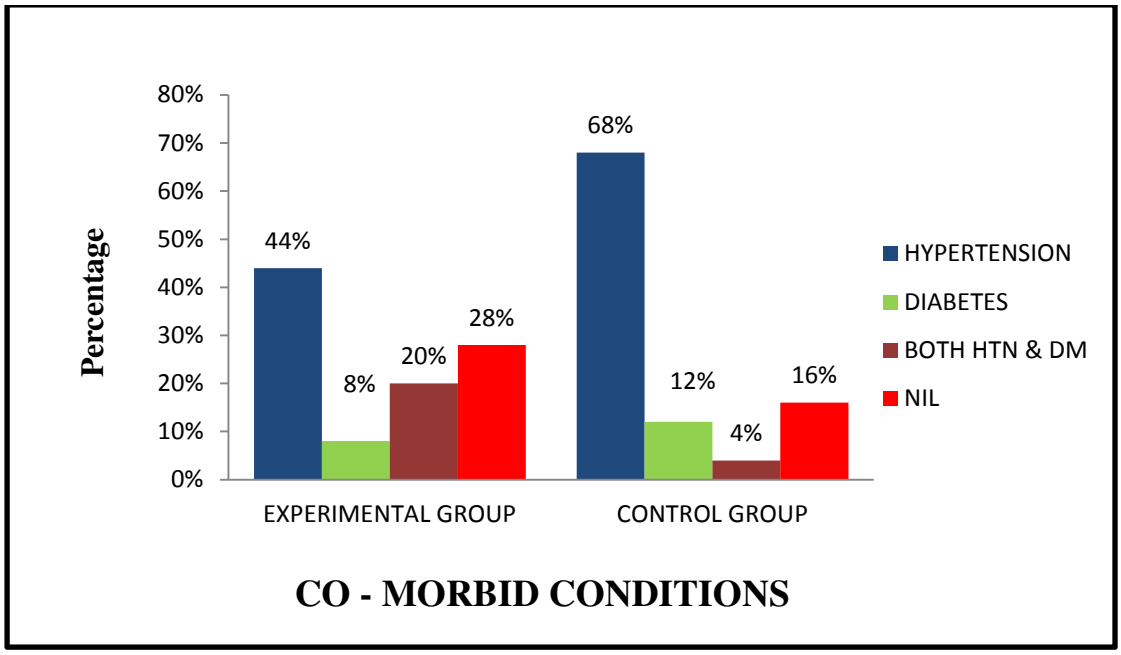

Figure 4.1.12 In the experimental group 2(8%) have diabetes, 5(20%) have both hypertention and diabetes, 11(44%) have hypertention and 7(28%) have not affected with the above conditions. In control group half of them 17(68%) have hypertention, 3(12%) have diabetes, only 1(4%) of them have both hypertention and diabetes and 4(16%) have not affected with the above conditions.

Distribution of subjects according to Duration of illness

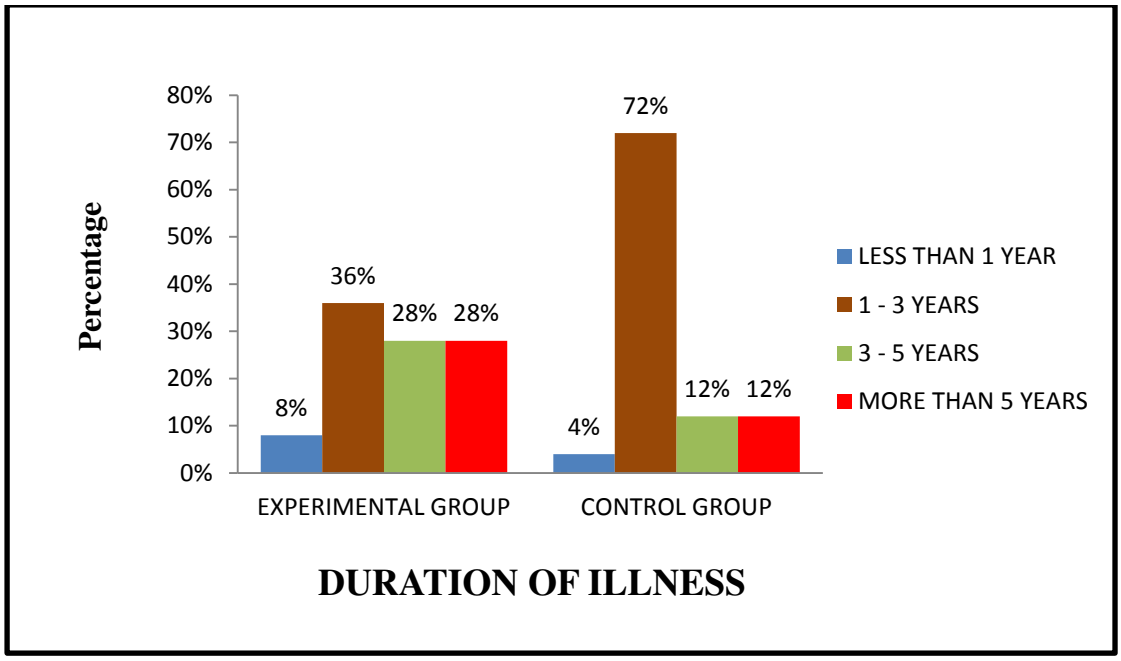

Figure 4.1.13 shows that 9(36%) of the subjects had duration of illness between 1 – 3 years, 7(28%) of them had duration of illness between 3 and more than 5 years, 2(8%) of them had duration of illness less than 1 year in the experimental group. Whereas among 25 subjects, half of them 18(72%) had duration of illness between 1 – 3 years, 3(12%) of them had duration of illness between 3 and more than 5 years, and only one had duration of illness less than 1 year.

Distribution of subjects according to Previous history of kidney transplantation

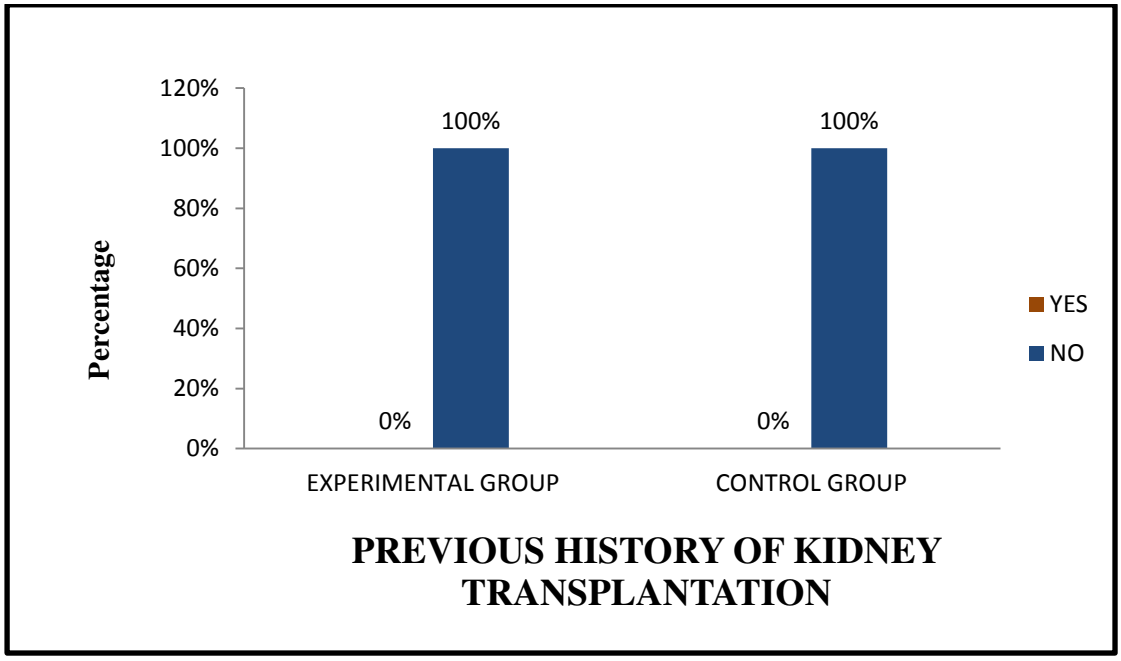

Figure 4.1.14 depicts about 25(100%) of the subjects both in experimental and control group had no history of previous history of kidney transplantation.

Distribution of subjects according to Period of hemodialysis in months

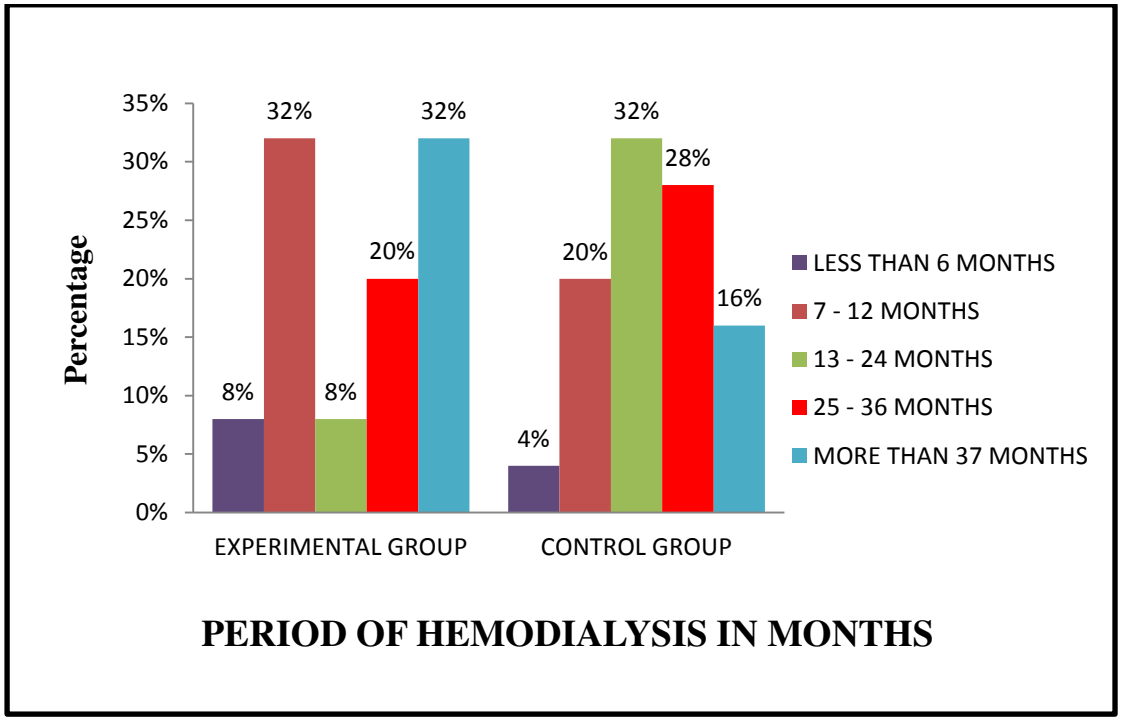

Figure 4.1.15 Illustrates the period of hemodialysis in months among 25 subjects of experimental group, 8(32%) were between 7 – 12 months and More than 37 months, 5(20%) were between 25 – 36 months, 2(8%) were between 13 – 24 months and Less than 6 months. Followed by in control group 8(32%) were between 13 – 24 months, 7(28%) were between 25 – 36 months, 5(20%) were between 7 – 12 months, 4(16%) were More than 37 months and only 1(4%) were Less than 6 months.

Distribution of subjects according to Presence of arteriovenous fistula in an arm

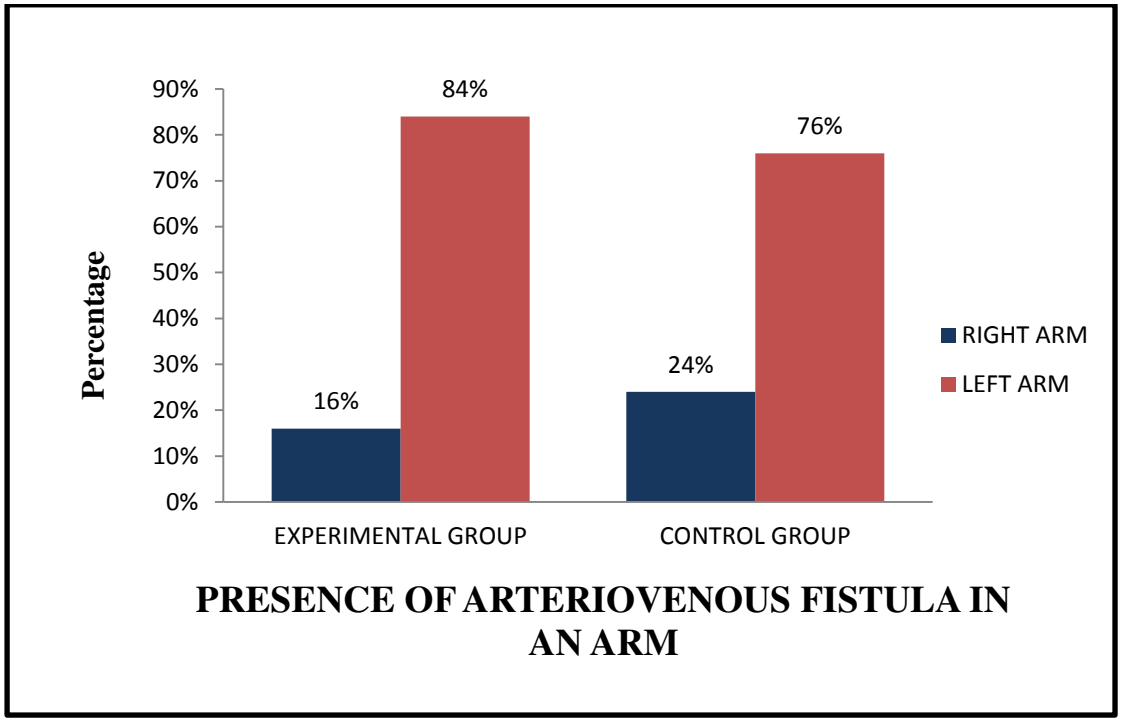

Figure 4.1.16 represents that, the presence of arteriovenous fistula among 25 subjects of the experimental group, Majority of them 21(84%) have arteriovenous fistula in their left arm, 4(16%) of them have in their right arm. In addition, among 25 subjects of control group 19(76%) have arteriovenous fistula in their left arm and 6(24%) of them have in their right arm.

Distribution of subjects according to the Site of arteriovenous fistula

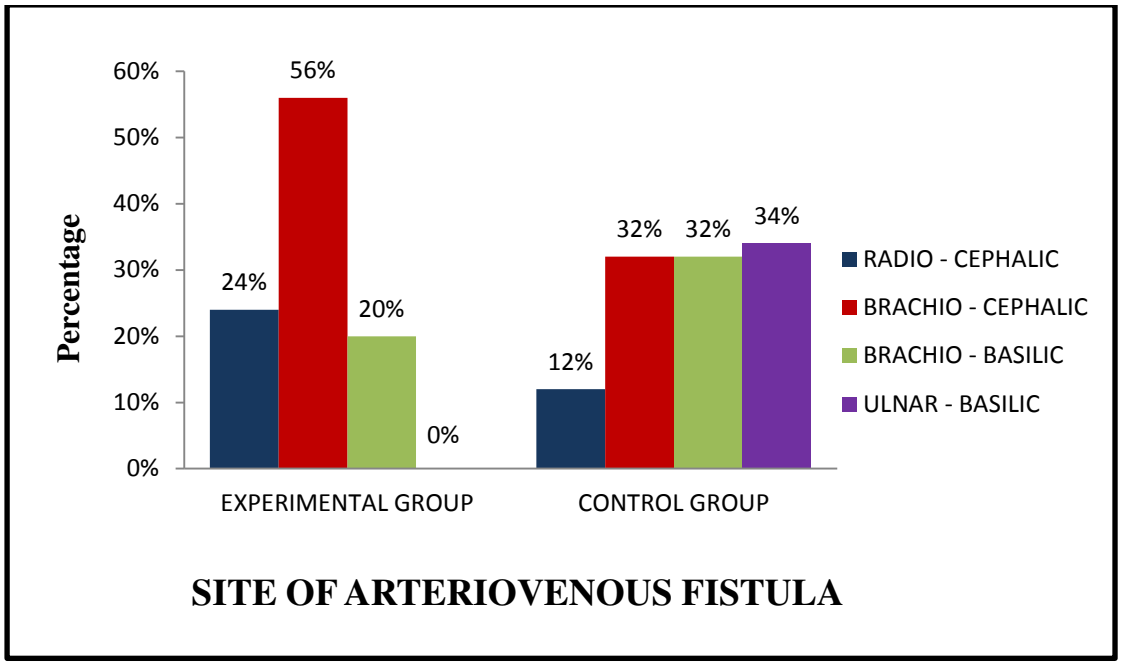

Figure 4.1.17 In the experimental group, found 14(56%) of them had brachio-cephalic, 6(24%) of them had radio-cephalic, 5(20%) had brachio-basilic and none of them had ulnar-basic. In the control group, each 8(32%) had brachio-cephalic and brachio-basilic, 6(24%) had ulnar-basilic, 3(12%) had radio – cephalic.

Distribution of subjects according to Duration of present arteriovenous fistula site use

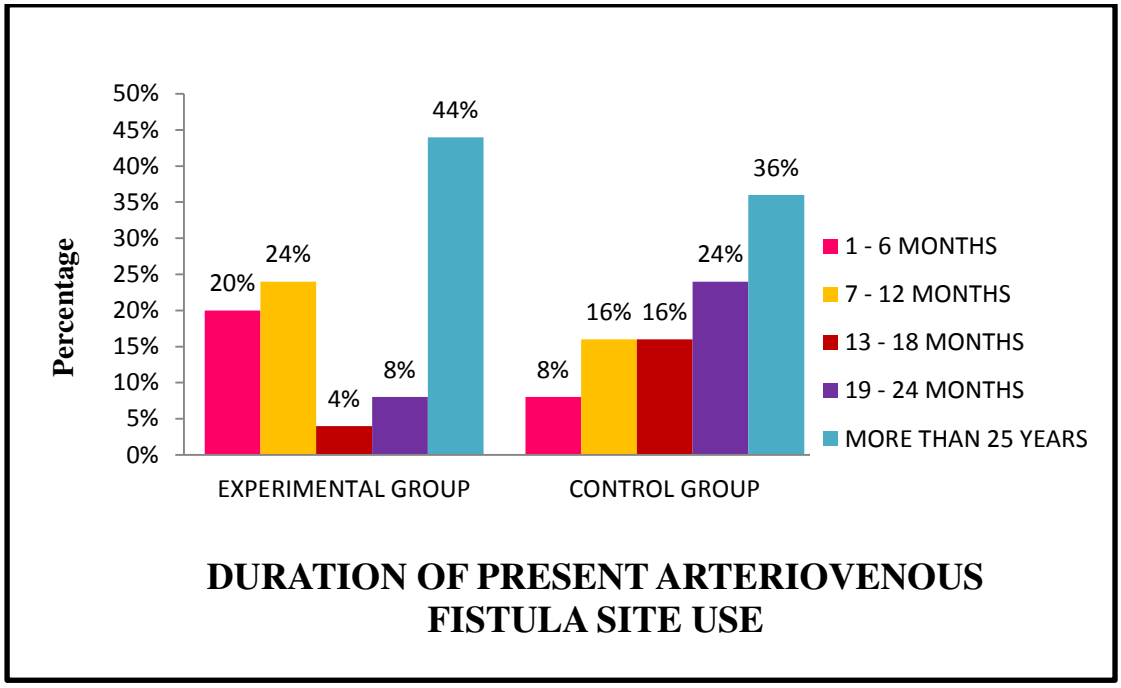

Figure 4.1.18 represents the duration of present AV fistula site use among 25 subjects of experimental group, only 1(4%) had between 13 – 18 months, 2(8%)had between 19 – 24 months, 5(20 %) of them had between 1 – 6 months, 6(24%) of them had between 7 – 12 months and 11(44%) of them had More than 25 months. In control group, among 25 subjects, 2(8%) had between 1 – 6 months, 4(16%) of them had between 7 – 12 months and another 4(16%) of them had between 13 – 18 months, 6(24%) of them had between 19 – 24 months and 9(36%) of them had More than 25 months.

Distribution of subjects according to Time duration of hemodialysis procedure

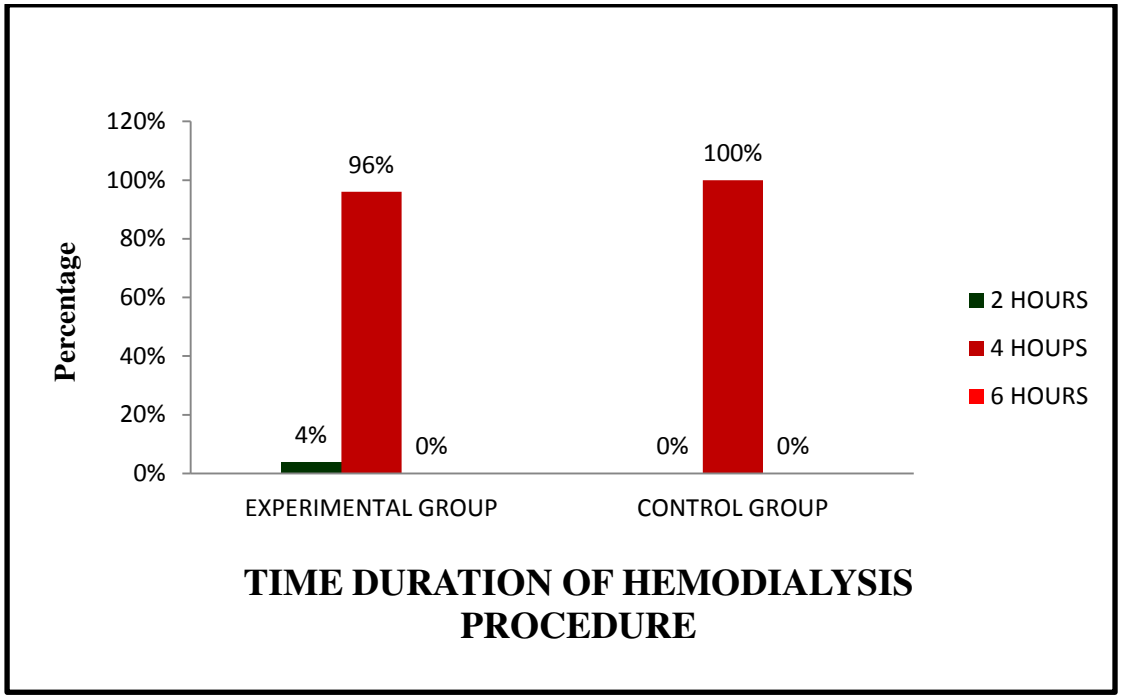

Figure 4.1.19 describes the time duration of hemodialysis procedure among 25 samples, 24(96%) were attending 4 hours and only 1(4%) attending 2 hours in experimental group. And overall 25(100%) were attending 4 hours in the control group.

Distribution of subjects according to Frequency of attending dialysis in a week

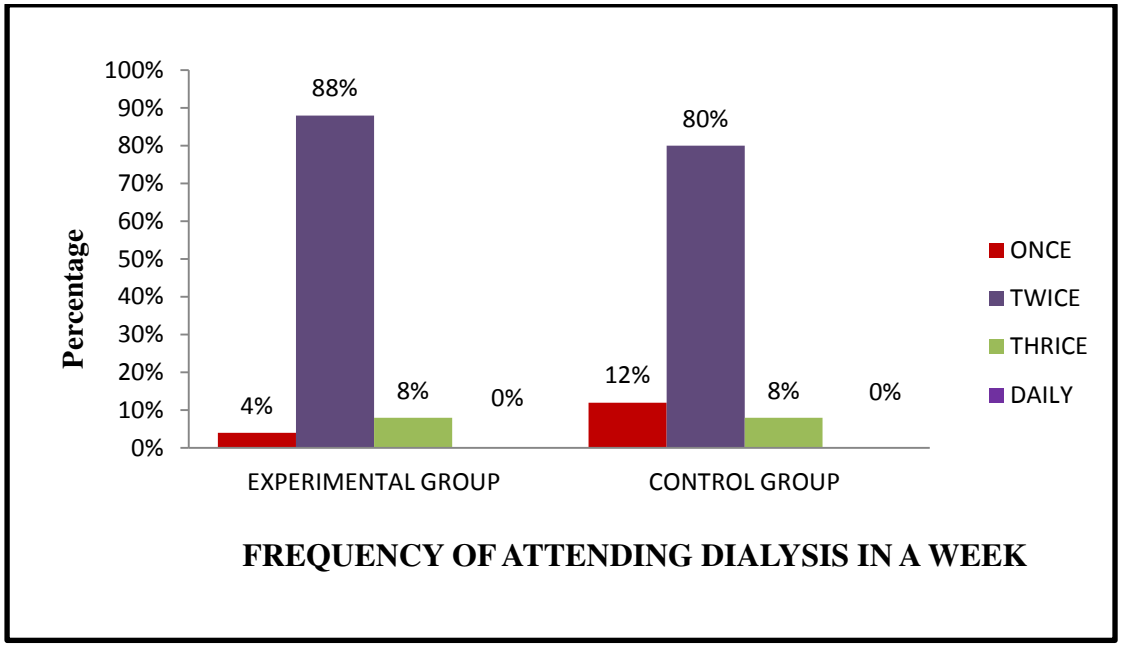

Figure 4.1.20 depicts the frequency of attending dialysis in a week, among 25 subjects, majority 22(88%) were attending weekly twice in the experimental group. And majority 20(80%) were attending weekly twice in control group.

Distribution of subjects according to Number of dialysis per month

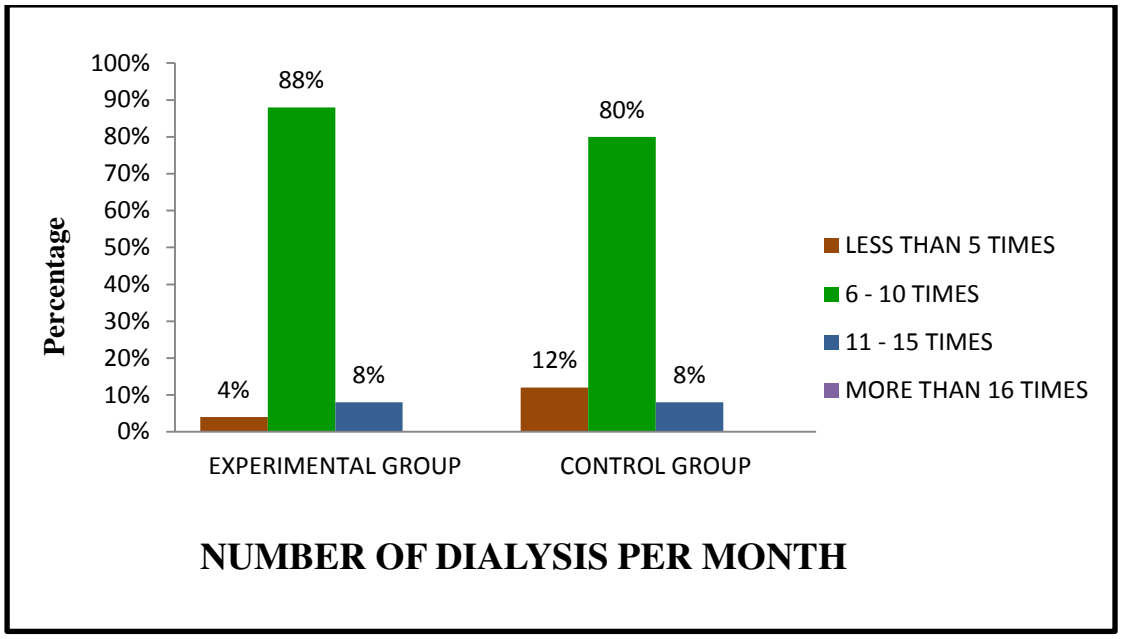

Figure 4.1.21 narrates the patients attending number of dialysis per month, among 25 subjects majority 22(88%) of them were attending 8 times per month in experimental group. Majority 20(80%) of them were attending 8 times per month in control group.

Distribution of subjects according to amount of fluid clearance

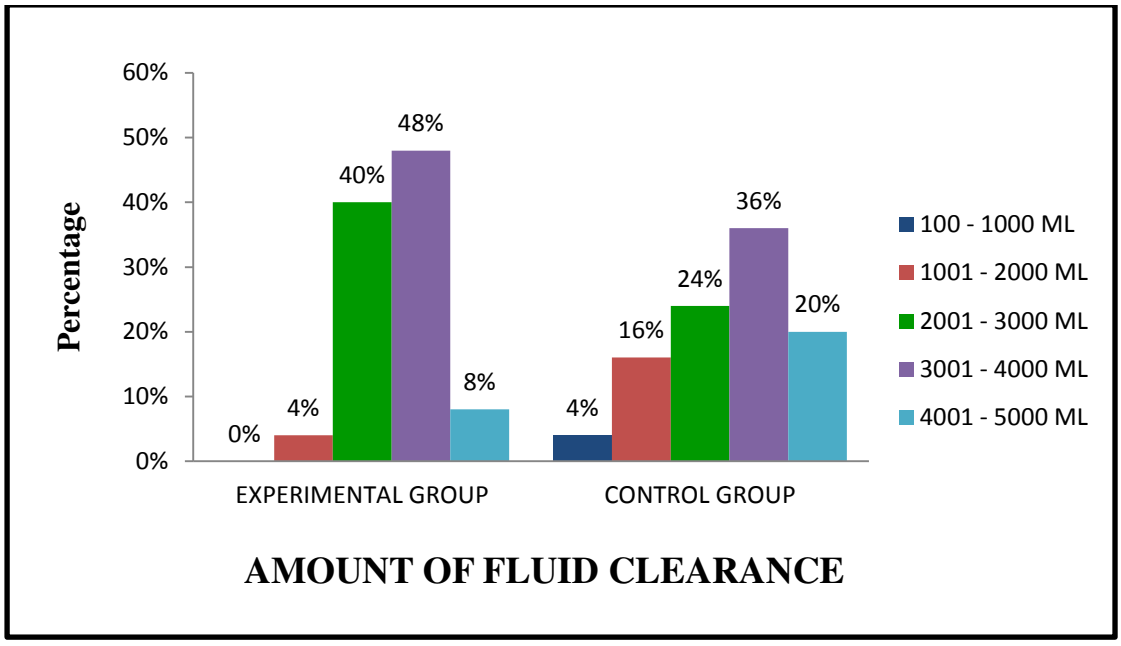

Figure 4.1.22 depicts the hemodialysis patients according to the amount of fluid clearance during dialysis. Among 25 subjects, half of them 12(48%) were between 3001 – 4000 ml in experimental group and 9(36%) were between 3001 – 4000 ml in the control group.

Distribution of subjects according to Weight in kilograms

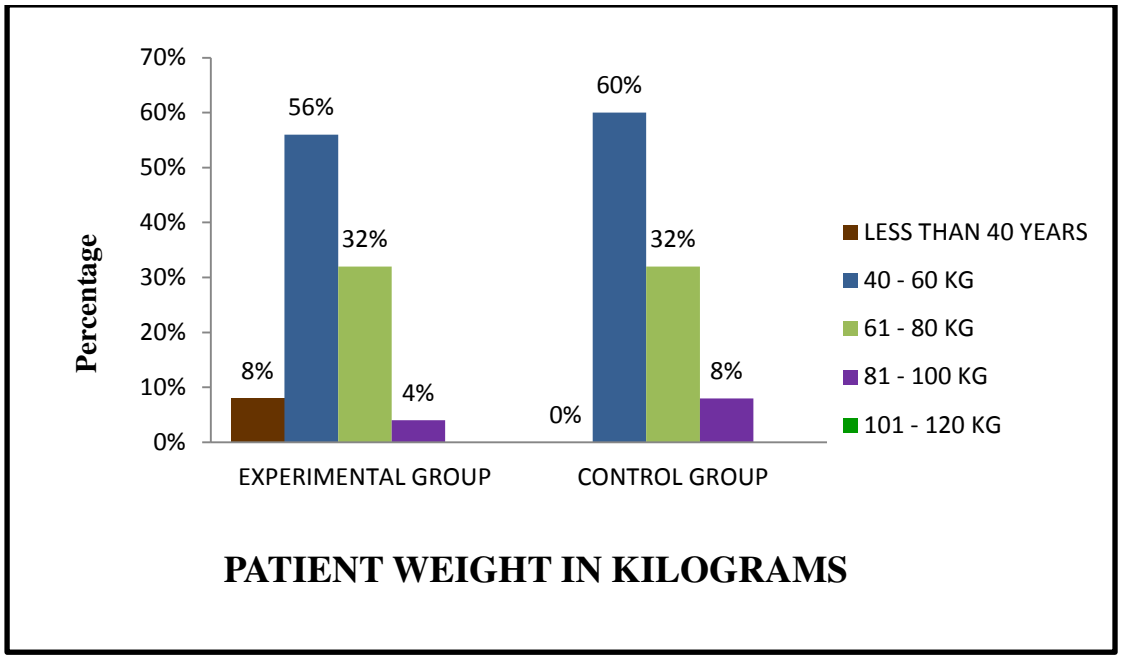

Figure 4.1.23 shows the hemodialysis patients according to their weight in kilogram. Among 25 subjects half of them 14 (56%) were between 40 – 60 kg in the experimental group whereas 15(60%) were between 40 – 60 kg in the control group.

Distribution of subjects according to Techniques of arteriovenous fistula cannulation

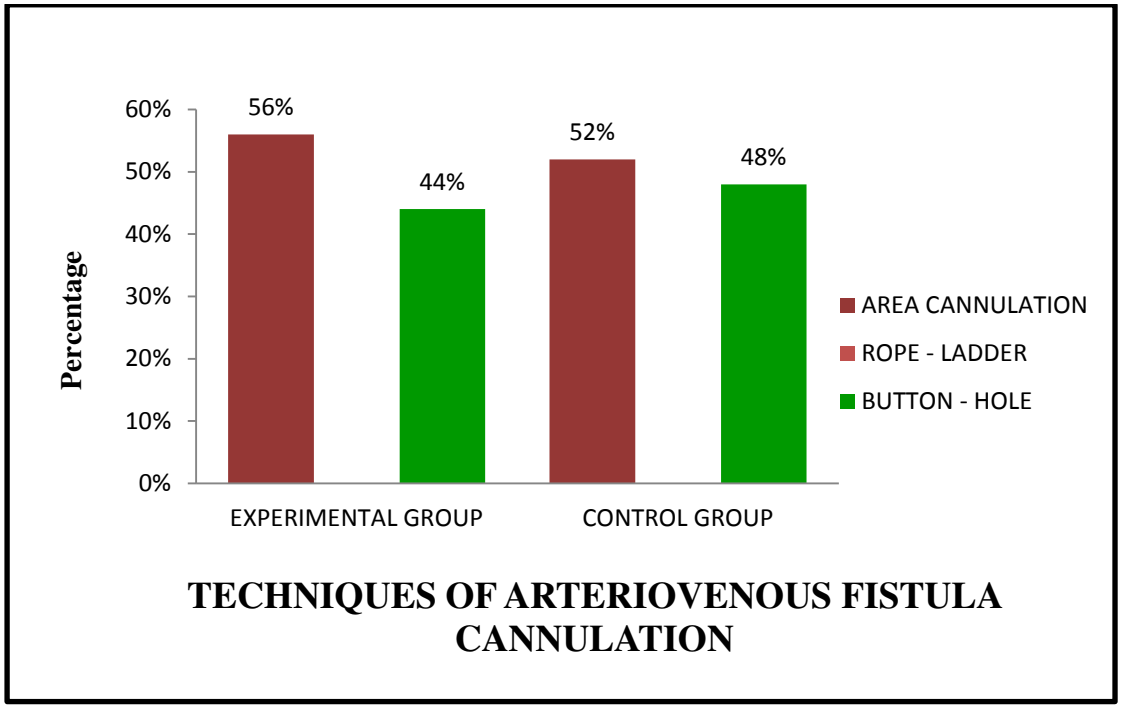

Figure 4.1.24 In experimental group, techniques of AV cannulation among 25 subjects 14(56%) had area cannulation puncture, 11(44%) had button – hole method, none of them had rope – ladder technique. In control group, 13(52%) had area cannulation puncture, 12(48%) had button – hole method, none of them had rope – ladder technique.

Distribution of subjects according to Size of arteriovenous cannula used

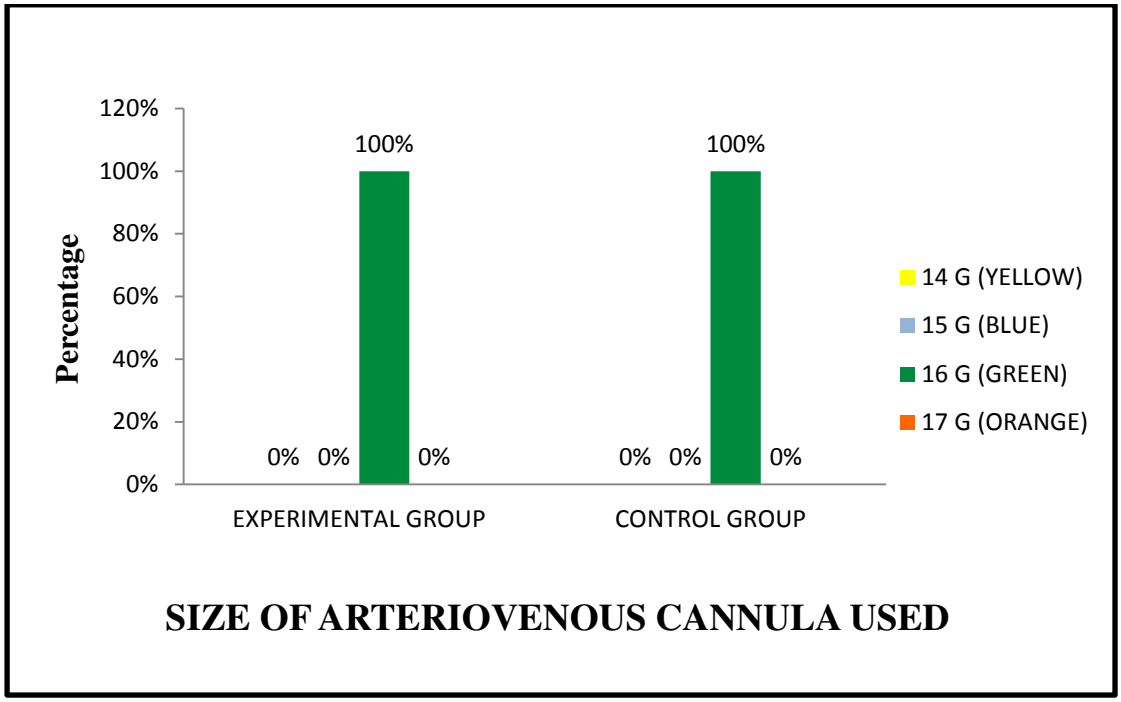

Figure 4.1.25 overall, all the patients both in experimental and control group had arteriovenous needle puncture in the size of 16 G (Green). None of them had anyother size needle.

Distribution of subjects according to Complications of arteriovenous fistula

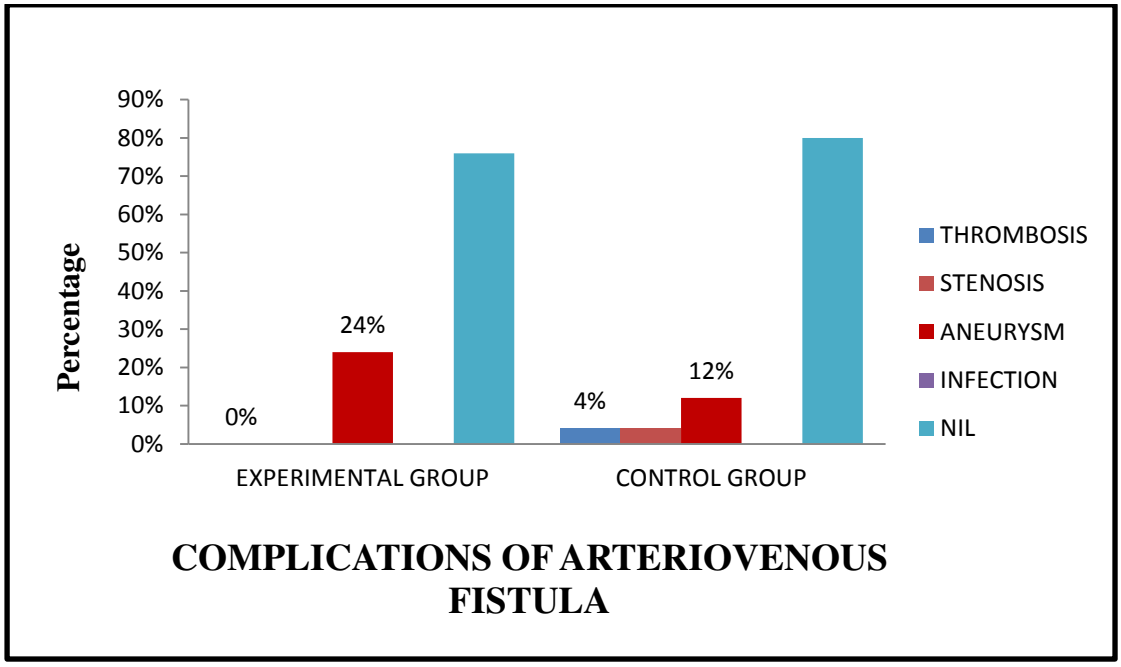

Figure 4.1.26 reveals the hemodialysis patients according to the complications of arteriovenous fistula. Among 25 subjects, half of them 19(76%) had no complications in experimental group and Majority 20(80%) had no complications in control group.

SECTION – II

Table 4.2.1 DISTRIBUTION OF POST-TEST SCORE OF ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HEMODIALYSIS PATIENTS IN EXPERIMENTAL AND CONTROL GROUP

Pain score	Experimental Group		Control Group	
	NO	%	NO	%
No pain	4	16%	2	8%
Mild pain	16	64%	12	48%
Moderate pain	5	20%	8	32%
Severe pain	0	0%	3	12%
Worst pain	0	0%	0	0%
Total	**25**	**100%**	**25**	**100%**

Distribution of Post-test score of arteriovenous fistula puncture pain among hemodialysis patients in Experimental and Control group

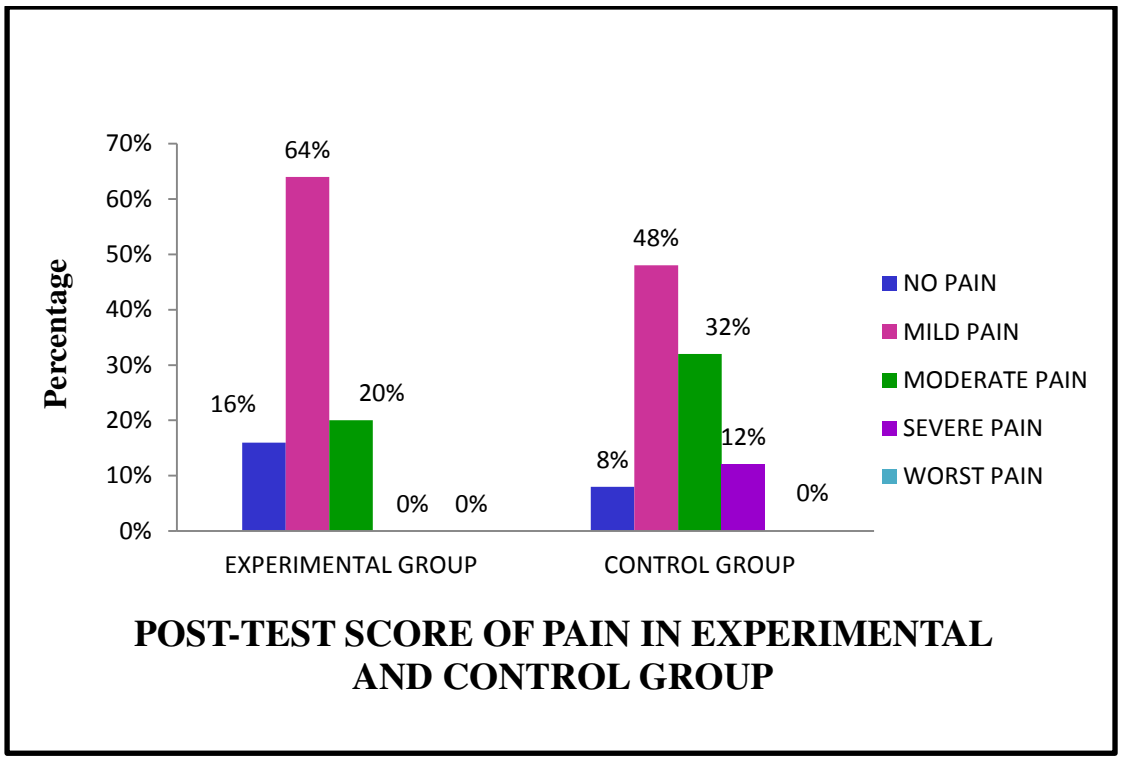

Table 4.2.1 shows the post-test score of pain among subjects in the experimental group and control group. Majority of the subjects in the experimental group 4(16%) experienced no pain, 16(64%) experienced mild pain, 5(20%) experienced moderate pain. Well, none of them experienced severe and worst pain during arteriovenous fistula puncture (cannulation). Majority of subjects in the control group 2(8%) experienced no pain, 12(48%) experienced mild pain, 8(32%) experienced moderate pain, 3(12%) experienced severe pain and none of them experienced worst pain during arteriovenous fistula puncture.

SECTION – III

Table 4.3.1 EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HEMODIALYSIS PATIENTS

(N = 50)

Group	Max score	Range score	Mean	Mean %	SD	Mean difference	Unpaired 't' value
Experimental group	26	0-5	2.4	9.230	1.46	1.2	2.14
Control group	26	0-9	3.6	13.846	2.37		

Table 4.3.1 shows that the Mean, Mean %, Standard Deviation of pain score among patients during arteriovenous fistula puncture (cannulation) in the experimental group found to be 2.4(9.230%) with standard deviation 1.46 and In control group, was found to be 3.6(13.846%) with standard deviation 2.37. In order to calculate and analyze an unpaired t' test with a view to the effectiveness of cold application on arteriovenous fistula puncture pain in experimental group. And viewed that the t' test score was 2.14 and when it is compared to the table value, was high. It indicates that the cold application on arteriovenous fistula puncture pain is effective.

SECTION – IV

TABLE 4.4.1 ASSOCIATION BETWEEN THE POST-TEST SCORE OF PAIN AMONG SUBJECTS IN THE EXPERIMENTAL GROUP WITH SOCIO DEMOGRAPHIC VARIABLES

(N = 50)

Variables	Pain score			Chi-square value	Results
	No pain	Mild pain	Moderate pain		
Age					
20-40 years	0	7	1	df=4	**NS**
41-60 years	3	5	4	χ^2=9.488	
61-80 years	1	4	0		
Gender					
Male	3	8	1	df=2	**NS**
Female	1	8	4	χ^2=2.764	
Educational status					
Illiterate	0	4	3	df= 6	**NS**
Primary education	3	10	1	χ^2=7.723	
Secondary education	1	1	0		
Higher secondary	0	0	0		
Diploma	0	0	0		
Upper graduate	0	1	1		
Post graduate	0	0	0		
Occupational status					
Government employee	0	0	0	df=6	**NS**
Private employee	1	1	0	χ^2=10.02	
Business	2	3	0	8	
Daily wage	0	0	1		
Unemployed	1	12	4		

Variables	Pain score			Chi-square value	Results
	No pain	Mild pain	Moderate pain		
Marital status					
Single	0	4	1	df=2	**NS**
Married	4	12	4	χ^2=1.250	
Widow / Widower	0	0	0		
Separated	0	0	0		
Divorced	0	0	0		
Type of family					
Nuclear	4	15	5	df=2	**NS**
Joint	0	0	0	χ^2=0.586	
Extended family	0	1	0		
Duration of sleep at night time					
0 – 3 hrs	0	3	0	df=4	**NS**
4 – 6 hrs	3	9	4	χ^2=2.155	
7 – 9 hrs	1	4	1		
Above 10 hrs	0	0	0		
Dietary pattern					
Vegetarian	1	4	1	df=2	**NS**
Non – vegetarian	3	12	4	χ^2=0.055	
Personal habits					
Alcohol	0	0	0	df=8	**NS**
Smoking	0	1	0	χ^2=12.58	
Chewing tobacco	0	1	0	9	
Supari pan/betal nut	0	0	2		
Using drugs	0	0	0		
Multiple drugs	0	6	1		
No habits	4	8	2		

Variables	Pain score			Chi-square value	Results
	No pain	Mild pain	Moderate pain		
Recreational activities during dialysis procedure					
Watching television	2	8	2	df=6	**NS**
Listening music	1	0	1	χ^2=8.331	
Playing mobile games	0	0	0		
Reading newspaper	1	0	0		
Reading books	0	8	2		

N= Significant **NS= Not Significant**

Table 4.4.1 presents substantive summary of chi-square analysis, which was used to bring out the association between the post-test pain score and the selected socio demographic variables in the experimental group. The analysis revealed that, there was no statistically significant association found with the demographic variables of age, gender, religion, educational status, occupational status, marital status, type of family, and duration of sleep at night time, dietary pattern, personal habits, and recreational activities during dialysis procedure.

TABLE 4.4.2 ASSOCIATION BETWEEN THE POST-TEST SCORE OF PAIN AMONG SUBJECTS IN THE EXPERIMENTAL GROUP WITH SELECTED CLINICAL DATA

(N = 50)

Variables	Pain Score			Chi-square Value	Results
	No pain	Mild pain	Moderate pain		
Co – morbid conditions					
Hypertension	1	8	2	df=6	**NS**
Diabetes mellitus	1	1	0	χ^2=12.592	
Both HTN & DM	2	2	1		
Nil	0	5	2		
Period of Haemodialysis in months					
Less than 6 months	0	2	0	df=4	**NS**
7 – 12 months	2	6	0	χ^2=15.507	
13 – 24 months	0	2	0		
25 – 36 months	1	1	3		
More than 37 months	1	5	2		
Presence of arteriovenous fistula in an arm					
Right arm	0	3	1	df=2	**NS**
Left arm	4	13	4	χ^2=5.991	
Site of arteriovenous fistula					
Radio – cephalic	1	4	1	df= 6	**NS**
Brachio – cephalic	3	8	3	χ^2=12.592	
Brachio – basilic	0	4	1		
Ulnar – basilica	0	0	0		

Variables	Pain Score			Chi-square Value	Results
	No pain	Mild pain	Moderate pain		
Duration of Present arteriovenous fistula site use					
1 – 6 months	1	3	1	df=8	**NS**
7 – 12 months	1	5	0	χ^2=15.507	
13 – 18 months	0	1	0		
19 – 24 months	1	1	0		
More than 25 months	1	6	4		
Frequency of attending dialysis in a week					
Once	0	0	1	df=6	**NS**
Twice	4	14	4	χ^2=12.592	
Thrice	0	2	0		
Daily	0	0	0		
Number of dialysis per month					
Less than 5 times	0	0	1	df=6	**NS**
6 – 10 times	4	14	4	χ^2=12.592	
11 – 15 times	0	2	0		
More than 16 times	0	0	0		
Patient weight in kilogram					
Less than 40 kg	0	1	1	df=8	**NS**
40 – 60 kg	0	12	2	χ^2=15.507	
61 – 80 kg	4	2	2		
81 – 100 kg	0	1	0		
101 – 120 kg	0	0	0		
Techniques of arteriovenous cannulation					
Area cannulation	0	9	5	df=4	**NS**
Rope – Ladder technique	0	0	0	χ^2=9.488	
Button – Hole method	4	7	0		

Variables	Pain Score			Chi-square Value	Results
	No pain	Mild pain	Moderate pain		
Size of arteriovenous cannula used					
14 G	0	0	0	df=6	**NS**
15 G	0	0	0	χ^2=12.592	
16 G	4	16	5		
17 G	0	0	0		

N= Significant **NS= Not Significant**

Table 4.4.2 presents substantive summary of chi-square analysis, which was used to bring out the association between the post-test pain score and the selected clinical data in the control group. The analysis revealed that, there was no statistically significant association found with the clinical data variables like co – morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patients weight in kilogram, techniques of arteriovenous cannulation and size of arteriovenous cannula used.

SECTION – V

TABLE 4.5.1 ASSOCIATION BETWEEN THE POST-TEST SCORES OF PAIN AMONG SUBJECTS IN THE CONTROL GROUP WITH SOCIO DEMOGRAPHIC VARIABLES

(N = 50)

Variables	Pain Score				Chi-square Value	Results
	No pain	Mild pain	Moderate pain	Severe pain		
Age in years						
20 – 40 years	1	2	3	1	df=6	**NS**
41 – 60 years	0	9	4	0	χ^2=10.220	
61 – 80 years	1	1	1	2		
Gender						
Male	1	11	5	2	df=3	**NS**
Female	1	1	3	1	χ^2=3.299	
Educational Status						
Illiterate	0	4	2	1	df=15	**NS**
Primary education	2	4	2	1	χ^2=10.198	
Secondary education	0	2	1	1		
Higher secondary	0	1	0	0		
Diploma	0	0	0	0		
Upper graduate	0	1	1	0		
Post graduate	0	0	2	0		
Occupational status						
Government employee	0	0	1	0	df=12	**NS**
Private employee	0	0	0	1	χ^2=11.227	
Business	0	2	1	0		
Daily wage	0	1	1	0		
Unemployed	2	9	5	2		

Variables	Pain Score				Chi-square Value	Results
	No pain	Mild pain	Moderate pain	Severe pain		
Marital status						
Single	0	0	1	0	df=6	**NS**
Married	2	12	5	3	χ^2=7.244	
Widow / Widower	0	0	2	0		
Seperated	0	0	0	0		
Divorced	0	0	0	0		
Type of family						
Nuclear	1	12	8	3	df=3	**NS**
Joint	1	0	0	0	χ^2=11.979	
Extended	0	0	0	0		
Duration of sleep at night time						
0 - 3 hrs	0	2	1	0		**NS**
4 - 6 hrs	2	7	6	2	df=6	
7 - 9 hrs	0	3	1	1	χ^2=2.386	
Above 10 hrs	0	0	0	0		
Dietary pattern						
Vegetarian	0	2	2	1	df=3	**NS**
Non – vegetarian	2	10	6	2	χ^2=1.042	
Personal habits						
Alcohol	0	1	1	1	df=15	**NS**
Smoking	0	0	1	0	χ^2=20.278	
Chewing tobacco	0	2	2	0		
Supari pan / Betal nut	1	0	0	0		
Using harmful drugs	0	0	0	0		
Multiple habits	0	5	1	0		
No habits	1	4	3	2		

Variables	Pain Score				Chi-square Value	Results
	No pain	Mild pain	Moderate pain	Severe pain		
Recreational activities during dialysis procedure						
Watching television	2	11	5	3	df=6	**NS**
Listening music	0	0	3	0	λ^2=8.135	
Playing mobile games	0	1	0	0		
Reading news paper	0	0	0	0		
Reading books	0	0	0	0		

N= Significant **NS= Not Significant**

Table 4.5.1 presents substantive summary of chi-square analysis, which was used to bring out the association between the post-test pain score and the socio demographic variables in the control group. The analysis revealed that, there was no statistically significant association found with the demographic variables of age, gender, religion, educational status, occupational status, marital status, type of family, and duration of sleep at night time, dietary pattern, personal habits, and recreational activities during dialysis procedure.

TABLE 4.5.2 ASSOCIATION BETWEEN THE POST-TEST SCORES OF PAIN AMONG SUBJECTS IN THE CONTROL GROUP WITH SELECTED CLINICAL DATA

(N = 50)

Variables	Pain Score				Chi-square Value	Results
	No pain	Mild pain	Moderate Pain	Severe pain		
Co – morbid conditions						
Hypertention	1	7	6	3	df=9	**NS**
Diabetes mellitus	0	2	1	0	χ^2=16.919	
Both HTN & DM	0	1	0	0		
Nil	1	2	1	0		
Period of Hemodialysis in months						
Less than 6 months	0	0	0	1	df=12	
7 – 12 months	1	1	2	1	χ^2=21.026	**NS**
13 – 24 months	0	6	2	0		
25 – 36 months	0	4	3	0		
More than 37 months	1	1	1	1		
Presence of arteriovenous fistula in an arm						
Right arm	1	4	1	0	df=3	**NS**
Left arm	1	8	7	3	χ^2=7.815	
Site of arteriovenous fistula						
Radio – cephalic	0	2	1	0	df= 9	**NS**
Brachio – cephalic	0	5	2	1	χ^2=16.919	
Brachio – basilic	1	3	3	1		
Ulnar – basilica	1	2	2	1		

Variables	Pain Score				Chi-square Value	Results
	No pain	Mild pain	Moderate Pain	Severe pain		
Duration of Present arteriovenous fistula site use						
1 – 6 months	0	0	1	1	df=12	**NS**
7 – 12 months	1	1	1	1	χ^2=21.026	
13 – 18 months	0	4	0	0		
19 – 24 months	0	4	2	0		
More than 25 months	1	3	4	1		
Frequency of attending dialysis in a week						
Once	0	1	1	1		
Twice	2	10	7	1	df=9	**NS**
Thrice	0	1	0	1	χ^2=16.919	
Daily	0	0	0	0		
Number of dialysis per month						
Less than 5 times	0	1	1	1		
6 – 10 times	2	10	7	1	df=9	**NS**
11 – 15 times	0	1	0	1	χ^2=16.919	
More than 16 times	0	0	0	0		
Patient weight in kilogram						
Less than 40 kg	0	0	0	0	df=12	**NS**
40 – 60 kg	1	8	5	1	χ^2=21.026	
61 – 80 kg	1	2	3	2		
81 100 kg	0	2	0	0		
101 – 120 kg	0	0	0	0		

Variables	Pain Score				Chi-square Value	Results
	No pain	Mild pain	Moderate Pain	Severe pain		
Techniques of arteriovenous cannulation						
Area cannulation	0	4	6	3	df=6	**NS**
Rope -Ladder technique	0	0	0	0	χ^2=12.592	
Button – Hole method	2	8	2	0		
Size of cannula used						
14 G	0	0	0	0	df=9	**NS**
15 G	0	0	0	0	χ^2=16.919	
16 G	2	12	8	3		
17 G	0	0	0	0		

N= Significant **NS= Not Significant**

Table 4.5.2 presents substantive summary of chi-square analysis which was used to bring out the association between the post-test pain score and the selected clinical data variables in the control group. The analysis revealed that there was no statistically significant association found with the clinical data variables like co – morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patients weight in kilograms, techniques of arteriovenous cannulation and size of arteriovenous cannula used.

CHAPTER – V

DISCUSSION

This chapter describes the result with respect to the objective of the study. The purpose of the study was to assess the effectiveness of cold application on arteriovenous fistula puncture pain among hemodialysis patients at erode and namakkal district. The results of the study were based on statistical analysis. The data was collected with the help of semi structure interview schedule questionnare contains socio demographic variables, selected clinical data, numerical pain assessment scale to assess the pain score. The effectiveness of cold application on arteriovenous fistula puncture pain was assessed by using unpaired‘t’ test. Chi square test was used to find out the association between the post-test pain scores with socio-demographic variables and selected clinical data. The results of the study were discussed according to the stated objectives

FINDINGS BASED ON OBJECTIVES

1. To assess the arteriovenous fistula puncture pain among haemodialysis patients in Experimental and Control group.

The post-test score of pain among subjects in the experimental group and control group. Majority of the subjects in the experimental group 4(16%) experienced no pain, 16(64%) experienced mild pain, 5(20%) experienced moderate pain. None of them experienced severe and worst pain during arteriovenous fistula puncture (cannulation). Majority of subjects in the control group 2(8%) experienced no pain, 12(48%) experienced mild pain, 8(32%) experienced moderate pain, 3(12%) experienced severe pain and none of them experienced worst pain during arteriovenous fistula puncture.

2. To compare the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients between experimental and control group.

H_1: There is a significant difference in the arteriovenous fistula puncture pain among haemodialysis patients in experimental group.

It shows that the Mean, Mean %, Standard Deviation pain score of patients during arteriavenous fistula puncture (cannulation) in the experimental group found 2.4(9.230%) with standard deviation 1.46. In control group, was found 3.6(13.846%) with standard deviation 2.37. The calculated t' test value 2.14 was significantly greater than the table value 1.96 at $p \leq 0.05$ It was evident that cold application is effective on arteriovenous fistula puncture pain. **Hence the hypothesis H_1 was accepted**. This study was supported by the experimental study conduted by **Hamad S Al Amer et.al, (2017)** to determine the effect of cryotherapy on reducing pain during AVF cannulation among HD patients in the King Khalid Hospital, Tabuk, Kingdom of Saudi Arabia. The sample size was 62 patients. Randomization was used to assign the patients into the experimental (received cryotherapy) and control (no cryotherapy) groups. Descriptive and retrospective methods were used. The Arabic version of Wong-Baker pain rating scale was used to determine the pain score. The t-test result revealed that no significant difference in the three-paired observations with the P=0.476, 0.202, and 0.103 respectively at 0.05 level of confidence. The result implies that cryotherapy administered before the procedure is effective in reducing the level of pain experienced during AVF cannulation among the patients undergoing Hemodialysis.

3. To find out the post-test score of arteriovenous fistula puncture pain with Socio - demographic variables in Experimental and Control group.

4. To find the post-test score of arteriovenous fistula puncture pain with Clinical data in Experimental and Control group.

H_2: There is a significant association between the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in experimental and control group.

H_3: There is a significant association between the post-test score of arteriovenous fistula puncture pain with selected Clinical data in experimental and control group.

It shows the association between the post test pain score and the subjects' socio-demographic variables and clinical data. That, there was no statistical significant association found with socio-demographic variables such as age, gender, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits and recreational activities during dialysis procedure. The selected clinical data includes co – morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patients weight in kilograms, techniques of arteriovenous cannulation and size of arteriovenous cannula used. **Hence H_2 was not accepted**. This study suppored by the experimental conducted by **Dr. Arumugam Indira et. al, (2016)** to assess the effect of cold application on pre procedure pain due to arteriovenous fistula puncture in

hemodialysis patients. A simple random sampling technique was used for selecting sample of 60 patients (30 each in experimental and control groups) who were undergoing hemodialysis by using AVF. Hemodialysis patients, who met the inclusion criteria, were randomly assigned to experimental and control groups. The tools used were sociodemographic data and subjective pain scoring was done by using numerical rating scale. Descriptive statistics and inferential statistics such as paired t-tests, Independent t-test, Chi square were used. The study finding reveals that the subjective pain scores were found to be significantly (P = 0.01) reduced within the experimental group by cold application. The chi-square test revealed that there was no statistically significant association between the post-test pain score with the socio demographic variables and selected clinical data such as age, sex, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits, recreational activities during dialysis procedure, co-morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patient weight in kilogram, techniques of arteriovenous fistula cannulation and size of arteriovenous cannula used.

MAJOR FINDINGS OF THE STUDY

1.1. Findings related to socio demographic variables.

About 13(52%) subjects belong to the age group of 41 – 60 years. Most of the subjects 19(76%) were males. About 14(56%) subjects studied up to primary education. Most of the 18(72%) subjects were unemployed. Majority of the subjects

22(88%) were married. Majority 24(96%) subjects were belonging to nuclear family. Most of the 18(72%) subjects had sleep at night time between the duration of 4 – 6 hours. Majority 20 (80%) of the subjects were non – vegetarian. About 14(56%) of the subjects had no personal habits. Majority 21(84%) of the samples were watching television during dialysis procedure.

1.2. Findings related to clinical data

Majority of subjects 24(96%) were known case of chronic renal failure. Majority 21(84%) of the subjects having arteriovenous fistula in their left arm. Nearly half of the subjects 14(56%) had brachio – cephalic site of arteriovenous fistula. All of subjects 25(100%) attending duration of hemodialysis is 4 hours. Majority 22(88%) of the subjects were attending dialysis twice in a week and 8 times per month. Nearly half of the subjects 14(56%) had area cannulation. All the subjects 25(100%) had arteriovenous needle puncture in the size of 16 G (green). Majority 19(76%) of the subjects had no complications of arteriovenous fistula.

SUMMARY

This chapter dealt with analysis and interpretation of the data collected from hemodialysis patients with arteriovenous fistula cannulation by semi-structured questionnaire interview schedule. It also dealt with discussion of study results.

CHAPTER – VI

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

This chapter deals with summary of the study, its findings and conclusions. The implication of cold application is effective on arteriovenous fistula puncture pain among hemodialysis patients. Explanation with regard to objectives and findings are presented briefly followed by recommendation of the study.

SUMMARY

The main aim of the study was to assess the effectiveness of cold application on arteriovenous fistula puncture pain among hemodialysis patients.

OBJECTIVES

- To assess the arteriovenous fistula puncture pain among haemodialysis patients in Experimental and Control group.
- To compare the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients between experimental and control group.
- To find out the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in Experimental and Control group.
- To find out the post-test score of arteriovenous fistula puncture pain with selected Clinical data in Experimental and Control group.

HYPOTHESIS

H_1 : There is a significant difference in the arteriovenous fistula puncture pain among haemodialysis patients in experimental group.

H_2 : There is a significant association between the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in experimental and control group.

H_3 : There is a significant association between the post-test score of arteriovenous fistula puncture pain with selected Clinical data in experimental and control group.

The conceptual frame work adopted for this study was Modified Orlando's Nursing Process of research use, which addresses the implementation of existing research knowledge. The review of literature helped the investigator to develop conceptual frame work, determine the methodology for the study, and plan for analysis of the data in the most effective and efficient way.

The research approach adopted for the study was Non-randomized control group post-test only design. Quasi experimental design is the powerful tool for testing of hypothesis, causes, effect and relationship between the variables.

In this study, the investigator test the relationship between independent and dependent variables, the independent variable is cold application and dependent variable is arteriovenous fistula puncture pain.

The study was conducted in Dr. K.M.Nallasamy hoapital, Erode and VMCH hospital, Namakkal District, Tamilnadu. Non - purposive sampling technique was used to select the sample. After that, the samples were equally divided into experimental and control group. The samples consisted of 25 in experimental group and 25 in control group. The tool used for data collection was Semi structured interview schedule. It has 3 sections.

- *Section – A* consists of socio demographic variables.
- *Section – B* consists of clinical data.
- *Section – C* consists of Numerical Pain Assessment Scale to assess the pain response of subjects during arteriovenous fistula cannulation.

The pilot study was conducted during February 23.02.2018 to 27.02.2018 in Kalyani Kidney Care Hospital, Erode. About 10 samples were selected using non-probability convenience sampling technique. 5 samples were in experimental group and 5 were in control group. Confidentiality was assured to the subjects. The semi-structured interview schedule was used among 10 patients. Cold application was administered to the patients in the experimental group. The reliability of the tool was r = 0.93 established by inter rater reliability. The instrument was found to be reliable to conduct the study. The purpose of the study were

- To find out the feasibility of conducting final study.
- To test the tool.
- To determine the method of statistical analysis.

The Main study was conducted from 01.03.2018 to 30.03.2018 in Dr.K.M.Nallasamy hospital, Erode and VMCH hospital, Namakkal District. Non-probability convenience sampling technique was used. The intervention was given only to experimental group. The data gathered were analyzed and interpreted in terms of objectives. Descriptive and inferential statistics were used in data analysis. The Result of the study revealed that, after cold application, the Mean pain score in the experimental group were 2.4 where as in control group the Mean pain score were 3.6 In the experimental group, Maximum pain score was 5, where in control group the maximum pain score was 9.

MAJOR FINDINGS OF THE STUDY

1. Findings related to socio demographic variables and selected clinical data

1.1. Findings related to socio demographic variables.

About 13(52%) subjects belong to the age group of 41 – 60 years. Most of the subjects 19(76%) were males. About 14(56%) subjects studied up to primary education. Most of the 18(72%) subjects were unemployed. Majority of the subjects 22(88%) were married. Majority 24(96%) subjects were belonging to nuclear family. Most of the 18(72%) subjects had sleep at night time between the duration of 4 – 6 hours. Majority 20 (80%) of the subjects were non – vegetarian. About 14(56%) of the subjects had no personal habits. Majority 21(84%) of the samples were watching television during dialysis procedure.

1.2. Findings related to clinical data.

Majority of subjects 24(96%) were known case of chronic renal failure. Majority 21(84%) of the subjects having arteriovenous fistula in their left arm. Nearly half of the subjects 14(56%) had brachio – cephalic site of arteriovenous fistula. All of subjects 25(100%) attending duration of hemodialysis is 4 hours. Majority 22(88%) of the subjects were attending dialysis twice in a week and 8 times per month. Nearly half of the subjects 14(56%) had area cannulation. All the subjects 25(100%) had arteriovenous needle puncture in the size of 16 G (green). Majority 19(76%) of the subjects had no complications of arteriovenous fistula.

2. Effectiveness of cold application on arteriovenous fistula puncture pain.

This study revealed that, in experimental group among 25 patients, 16(64%) experienced mild pain, 5(20%) experienced moderate pain, 4(16%) experienced no pain and none of them experienced severe and worst pain during arteriovenous fistula puncture. But, in control group among 25 patients, 12(48%) experienced mild pain, 8(32%) experienced moderate pain, 3(12%) experienced severe pain, 2(8%) experienced no pain, and none of them experienced worst pain during arteriovenous fistula puncture.

Followed by, in experimental group the Mean pain score is 2.4, Mean percentage is 9.230 and standard deviation is 1.46. In control group, the mean pain score is 3.6, Mean percentage is 13.846 and standard deviation is 2.37. The‘t’ value is 2.14 ($p = 0.05$, 48 df, $t=1.96$) which is statistically significant and this study showed that, the cold application is effective in reducing arteriovenous fistula puncture pain.

3. Assessment of post-test score of pain in experimental and control group with Socio demographic variables.

Chi-square test was used to assess the post-test score of pain in experimental and control group with socio demographic variables. It was concluded that age, gender, educational status, occupational status, marital status, type of family, duration of sleep at night time, dietary pattern, personal habits recreational activities during dialysis procedure were non-significant at 0% level.

4. Association between post test pain score in the experimental group with selected clinical data.

Chi-square test was used to assess the post-test score of pain in experimental and control group with selected clinical data. It was concluded that Co – morbid conditions, period of hemodialysis in months, presence of arteriovenous fistula in an arm, site of arteriovenous fistula, duration of present arteriovenous fistula site use, frequency of attending dialysis in a week, number of dialysis per month, patients weight in kilograms, techniques of arteriovenous cannulation, size of arteriovenous cannula used were non-significant at $P \leq 0.05$ level.

CONCLUSION

The present study showed that samples in the control group had pain upto severe pain during post test, but after the cold application there was a significant reduction upto moderate pain in experimental group. The pain scores remains same and even some clients' pain level got increased among control group. This implies that cold application is effective on arteriovenous fistula puncture pain among

hemodialysis patients. And this effect was demonstrated through Numerical pain assessments scale.

NURSING IMPLICATIONS

The present study has got implications in the field of nursing, nursing administration, nursing research and nursing service. The nurse as a health care provider should be able to make significant contributions to decrease the pain of the patients during arteriovenous fistula cannulation and hence it reduces the needle phobias and sufferings related to the alternative dialysis attendance in the hospital.

1. Nursing Service

The study highlights the positive effect of nonpharmacological intervention in reducing the pain response during arteriovenous fistula cannulation. It allows the provision of research based nursing care. It can necessitate motivating and educating the nursing staff to adopt non-pharmacological pain relief measure before invasive procedures. The study proves that simple interventions like cold application can effectively reduce the arteriovenous fistula puncture pain among hemodialysis patients, which is inexpensive and free from side effects to the patients. This study will help to decrease the puncture pain and sufferings of the patients attending alternative dialysis sessions and avoids the development of psychological problems like needle phobia in future.

2. Nursing Administration

Nursing administrators should take initiation in creating policies and plans regarding the use of non-pharmacological pain relief measures before invasive

procedures. There is a need in organizing in service education programme for nursing personnel regarding the use of cold application before arteriovenous fistula cannulation. And can implement this in nursing practice. Nurse administrators should also plan out the pain relief measures in collaboration with other departments like physicians, anesthetists, phlebotomists etc.

3. Nursing Education

The clinical instructors can use research findings in clinical teaching. Nurse educators can teach this as a new technique for pain reduction during arteriovenous fistula cannulation. Nursing students should be encouraged to use different pain relief measures before all invasive procedures.

4. Nursing Research

Disseminate the findings through Conferences, Seminar and publication in Professional, National and International Journals. The researcher can encourage the use of cold application on arteriovenous fistula puncture pain among hemodialysis patients. The generalization of study result can be made by further replication of the study. As per the study a nursing care guide can be developed for future reference and the care of hemodialysis patients. The findings of the study help to expand the scientific body of professional knowledge upon which further research can be conducted.

RECOMMENDATIONS OF THE STUDY

In the light of the above study the following recommendations are put forth.

- A similar study can be conducted for a large sample to draw more conclusive generalization.
- A comparative study can be conducted with two different age groups.
- A study can be conducted by using cold application as a pain relief measure before intravenous cannula insertion.
- A similar study can be conducted by using cold application as a pain relief measure for stomach cramps for peritoneal dialysis patients.

LIMITATIONS

- The study is limited to assessment of specific aspect i.e. score of arteriovenous fistula puncture pain of the patients undergoing haemodialysis.
- The study is limited to two hospitals.
- The study is limited to the sample size of 50.
- The study is limited to five weeks.

SUMMARY

This chapter deals with summary, major findings of the study, implication and recommendations that guide the researcher to understand in depth about reason for hemodialysis patients developing complications and means to rectify them.

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APPENDIX – I

LETTER SEETING PERMISSION TO CONDUCT THE STUDY

From

Mrs.S.ANUPREETHI
II Year M.Sc nursing, [Medical Surgical Nursing]
Vivekananda College of Nursing,
Elayampalayam, Tiruchengode.

To

Principal,
Vivekananda College of Nursing
Elayampalayam, Tiruchengode.

Respected Madam,

Sub: Seeking permission to conduct research study in Dr.K.M.Nallasamy Hospital, Erode & VMCH Hospital, Namakkal District - reg.

I **Mrs.S.Anupreethi, II year M.Sc Nursing Student**, Vivekananda College of Nursing, Elayampalayam, Tiruchengode. As a part of the fulfilment of academic requirement for the completion of course I have undertaken a thesis on the topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HAEMODIALYSIS PATIENTS IN VMCH HOSPITAL, NAMAKKAL DISTRICT, TAMILNADU"**

Hence I kindly request your permission to carry out the research study in above settings.

Thanking you

Place: Elayampalayam Yours faithfully

Date: **(Mrs.S.ANUPREETHI)**

APPENDIX – II

LETTER GRANTING PERMISSION TO CONDUCT THE STUDY

VIVEKANANDHA COLLEGE OF NURSING
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.
Elayampalayam - 637 205. Tiruchengode, Namakkal Dt., Tamil Nadu.
Phone & Fax : 04288 - 234675.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

LETTER GRANTING PERMISSION TO CONDUCT THE STUDY

From

Ms. S. Anupreethi,

II Year M.Sc., Nursing (Medical-Surgical Nursing),

Vivekananda College of Nursing, Elayampalayam,

Thiruchengode.

To

The Chief Medical Officer,

Dr. K. M. Nallasamy Hospital,

93, Power house Road,

Erode.

Respected Sir,

Sub: Request Permission - To conduct study in Dr. K. M. Nallasamy Hospital, Erode.

I am Ms. Anupreethi.S, II year M.Sc Nursing, (Medical-Surgical Nursing) Student, Vivekananda College of Nursing, Elayampalayam, Tiruchengode. I have undertaken a thesis on the topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON AV FISTULA PUNCTURES PAIN AMONG HAEMODIALYSIS PATIENTS IN DR. K. M. NALLASAMY HOSPITAL, ERODE, TAMILNADU."** to be submitted to the Tamil Nadu Dr. M.G.R. Medical University as a partial requirement for Master Degree of Nursing.

Permission Granted

Dr. K.M. NALLASWAMY HOSPITAL
93, Power House Road,
Erode - 638 001.

Dr. N. YOHEESWARAN, M.B.B.S., DNB.,
Reg. No : 91862
Consultant Urologist

VIVEKANANDHA COLLEGE OF NURSING
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.
Elayampalayam - 637 205. Tiruchengode, Namakkal Dt., Tamil Nadu.
Phone & Fax : 04288 - 234675.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

OBJECTIVES OF THE STUDY:

- To assess the level of pain during AV fistula punctures among haemodialysis patients of Experimental group and Control group.
- To assess the effectiveness of cold application on AV fistula punctures pain among haemodialysis patients of experimental group.
- To find out the association between the levels of post test AV fistula punctures pain with selected socio demographic variables of Experimental group and Control group.

I would request you to kindly grant me permission to conduct the study in Dr. K. M. Nallasamy Hospital, Erode, by collection of necessary information related to the study for the period of two months from February to March. I will be grateful for your favourable action.

Thanking you

Yours faithfully,

(Ms .S. Anupreethi)

Place: Elayampalayam.

Date: .13.02.2018

13/2/18

PRINCIPAL,
VIVEKANANDHA COLLEGE OF NURSING,
ELAYAMPALAYAM-637 205,
Tiruchengode Tk, Namakkal Dt,
TAMIL NADU.

Dr. K.M. NALLASWAMY HOSPITAL
83, Power House Road,
Erode - 638 001.
Dr. N. YOHEESWARAN, M.B.B.S., DNB.,
Reg. No : 91862
Consultant Urologist

LETTER GRANTING PERMISSION TO CONDUCT THE STUDY

VIVEKANANDHA COLLEGE OF NURSING
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.
Elayampalayam - 637 205. Tiruchengode, Namakkal Dt., Tamil Nadu.
Phone & Fax : 04288 - 234675.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

LETTER GRANTING PERMISSION TO CONDUCT THE STUDY

From

Ms. S. Anupreethi,

II Year M.Sc., Nursing (Medical-Surgical Nursing),

Vivekananda College of Nursing, Elayampalayam,

Thiruchengode.

To

The Vice - Chairman,

Vivekananda Medical Care Hospital,

Elayampalayam,

Thiruchengode.

Respected Sir,

Sub: Request Permission - To conduct study in Vivekananda Medical Care Hospital, Elayampalayam, Thiruchengode.

I am Ms. Anupreethi. S, II year M.Sc., Nursing (Medical-Surgical Nursing) student, Vivekananda College of Nursing, Elayampalayam, Tiruchengode. I have undertaken a thesis on the topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON AV FISTULA PUNCTURES PAIN AMONG HAEMODIALYSIS PATIENTS IN SELECTED HOSPITALS, TAMILNADU."** to be submitted to the Tamil Nadu Dr. M.G.R. Medical University as a partial requirement for Master Degree of Nursing.

VIVEKANANDHA COLLEGE OF NURSING
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.
Elayampalayam - 637 205. Tiruchengode, Namakkal Dt., Tamil Nadu.
Phone & Fax : 04288 - 234675.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

OBJECTIVES OF THE STUDY:

- To assess the level of pain during AV fistula punctures among haemodialysis patients of Experimental group and Control group.
- To assess the effectiveness of cold application on AV fistula punctures pain among haemodialysis patients of experimental group.
- To find out the association between the levels of post test AV fistula punctures pain with selected socio demographic variables of Experimental group and Control group.

I would request you to kindly grant me permission to conduct the study in Vivekananda Medical Care Hospital, Elayampalayam, Thiruchengode, by collection of necessary information and assessing pain level using Numerical Pain Assessment Scale from the patients in the dialysis unit of VMCH hospital as a control group for the period of one month – April 2018. I have enclosed the Semi- Structured Questionnaire both in English and Tamil version for your kind perusal. I will be grateful for your favourable action.

Thanking you

Yours faithfully,

(Ms. S. Anupreethi)

Place: Elayampalayam

Date: 16.04.2018

Forwarded
16/4/2018.
PRINCIPAL,
VIVEKANANDHA COLLEGE OF NURSING,
ELAYAMPALAYAM-637 205,
Tiruchengode Tk. Namakkal Dt.
TAMIL NADU.

Permitted
Dr. K. KRUPANIDHI, M.D., (Emergency Medicine),
VICE CHAIRMAN,
Vivekanandha Medical Care Hospital,
ELAYAMPALAYAM-637 205,,
Tiruchengode Tk, Namakkal Dt, Tamil Nadu.

APPENDIX – III

LETTER FOR VALIDATION OF THE TOOL

From

Mrs.S.ANUPREETHI

II Year M.Sc Nursing, [Medical Surgical Nursing]

Vivekanandha College of Nursing,

Elayampalayam, Thiruchengode.

To

Through:

The Principal,

Vivekananda College of Nursing

Elayampalayam, Tiruchengode.

Subject: **Request for the content validation of the tool.**

Respected Madam,

I **Mrs.S.Anupreethi, II year M.Sc Nursing Student**, Vivekananda College of Nursing, Elayampalayam, Tiruchengode, have taken a project on **"A STUDY TO ASSESS THE EFFECTIVENESS OF COLD APPLICATION ON ARTERIOVENOUS FISTULA PUNCTURE PAIN AMONG HAEMODIALYSIS PATIENTS IN VMCH HOSPITAL, NAMAKKAL DISTRICT, TAMILNADU."** to be submitted to the Tamilnadu Dr. M.G.R. Medical University as a partial requirement for Master Degree of Nursing.

OBJECTIVES OF THE STUDY:

- To assess the arteriovenous fistula puncture pain among haemodialysis patients in Experimental and Control group.
- To compare the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients between experimental and control group.
- To find out the post-test score of arteriovenous fistula puncture pain with Socio-demographic variables in Experimental and Control group.
- To find out the post-test score of arteriovenous fistula puncture pain with selected Clinical data in Experimental and Control group.

I humbly request you to give me your valuable suggestions regarding the appropriateness of the tool, which I have enclosed. Kindly give your expert comments on the tool by using the evaluation criteria enclosed.

I also request you to kindly sign the certificate starting that you have validated the tool, your kind cooperation and your expert judgement will be very much appreciated.

Thanking you

Place: Yours faithfully,

Date:

(Mrs.S.ANUPREETHI)

ENCLOSURES

1. Tool
2. **Part – A: Socio - demographic Variables**
3. **Part – B: Clinical Data**
4. **Part – C: Numerical Pain Assessment Scale**
5. Certificate of validation
6. Evaluation criteria of check list

APPENDIX – IV

CERTIFICATE OF VALIDATION

This is to certify that tool consists of three parts which includes:

Part – A: Socio - demographic Variables

Part – B: Clinical Data

Part – C: Numerical Pain Assessment Scale

Prepared by Ms.Anupreethi.S, II Year M.Sc Nursing (Medical – Surgical Nursing) student, Vivekanadha College of Nursing, Elayampalayam to be used in her study titled "**A Study to assess the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients at erode and namakkal district."** has been validated by me.

Signature

Name:

Designation:

Date:

APPENDIX – V

EVALUATION CRITERIA FOR VALIDATION OF TOOL

Instructions

The expert is requested to go through the content and give your opinion in the column given in the criteria table. If the tool is not meeting the criteria, please give your valuable suggestion in the remarks column:

S. No	Tool	Less appropriate	Appropriate	More Appropriate	Remarks
Part – A	Socio Demographic Variables				
Part – B	Clinical Data				
Part – C	Numerical Pain Scale				

APPENDIX – VI

LIST OF EXPERTS WHO VALIDATED THE TOOL

1. **Dr. G.PONNUSAMI, M.S., DNB (URO),**
   Consultant Urologist and Andrologist,
   KMCH Specialty Hospital,
   Erode.

2. **Dr. V. NAGENDHRAN, M.D., D.M (NEPHROLOGY)**
   Consultant Nephrology & Transplant Physician,
   KMCH Specialty Hospital,
   Erode.

3. **Prof. Mrs. C. GRAZY M.Sc (N)., Ph.D.**
   Medical Surgical Nursing
   Dhanvanthri College of Nursing,
   Namakkal.

4. **Mrs. J. SHOBANA**
   Professor in Medical Surgical Nursing Department,
   Annai JKK Sampoorani Ammal College of Nursing, Komarapalayam,
   Erode.

5. **Mrs. SHEEJA. C**
   Associate Professor,
   Shanmuga College of Nursing,
   Salem.

6. **Mrs. M. SUDHADEVI, M.Sc (N)**
   Reader,
   Vellalar College of Nursing,
   Erode.

7. **Dr. A. CHANDRASEKARAN, M.A., M.Phil., Ph.D**
   Assistant Professor in Tamil Department,
   Vivekanadha Arts & Science Women's College, Elayampalayam,
   Thiruchengode, Namakkal.

APPENDIX – VII

CERTIFICATE FOR ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by Ms.Anupreethi.S, II year M.Sc.,Nursing student of Vivekanandha College of Nursing for dissertation "**A Study to assess the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients at erode and Namakkal district"** edited for English language appropriateness by **Mrs.Saranya.R M.A.,B.Ed.**

Signature

APPENDIX – VIII

CERTIFICATE FOR TAMIL EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by Ms.Anupreethi.S, II year M.Sc.,nursing student of Vivekanandha College of Nursing for dissertation "**A Study to assess the effectiveness of cold application on arteriovenous fistula puncture pain among haemodialysis patients at erode and Namakkal district"** edited for Tamil language appropriateness by **Dr.AChandrasekaran M.A, M.Phil., Ph.D.**

Signature

APPENDIX – IX

ENGLISH TOOL FOR DATA COLLECTION

SEMI STRUCTURED INTERVIEW SCHEDULE

PART - A

SOCIO- DEMOGRAPHIC VARIABLES

1. Age

(1.1) 20 – 40 Years ( )

(1.2) 41 - 60 Years ( )

(1.3) 61 – 80 Years ( )

2. Gender

(2.1) Male ( )

(2.2) Female ( )

3. Educational Status

(3.1) Illiterate ( )

(3.2) Primary Education ( )

(3.3) Secondary Education ( )

(3.4) Higher Secondary ( )

(3.5) Diploma ( )

(3.6) Upper Graduate ( )

(3.7) Post Graduate ( )

4. Occupational Status

(4.1) Government Employee ( )

(4.2) Private Employee ( )

(4.3) Business ( )

(4.4) Daily Wage ( )

(4.5) Unemployed ( )

5. Marital Status

(5.1) Single ( )

(5.2) Married ( )

(5.3) Widow/Widower ( )

(5.4) Separated ( )

(5.5) Divorced ( )

6. Type of family

(6.1) Nuclear ( )

(6.2) Joint ( )

(6.3) Extended Family ( )

7. Duration of Sleep at night time

(7.1) 0 - 3 hrs ( )

(7.2) 4 - 6 hrs ( )

(7.3) 7 – 9 hrs ( )

(7.4) Above 10 hrs ( )

8. Dietary Pattern

(8.1) Vegetarian ( )

(8.2) Non – vegetarian ( )

9. Personal Habits

(9.1) Alcohol ( )

(9.2) Smoking ( )

(9.3) Chewing Tobacco ( )

(9.4) Supari pan / Betal nut ( )

(9.5) Using harmful drugs ( )

(9.6) Multiple habits ( )

(9.7) No habits ( )

10. Recreational Activities during dialysis procedure

(10.1) Watching television ( )

(10.2) Listening Music ( )

(10.3) Playing mobile games ( )

(10.4) Reading Newspaper ( )

(10.5) Reading Books ( )

PART – B: CLINICAL DATA

11. Clinical causes for undergoing haemodialysis procedure

(11.1) Chronic Renal Failure ( )

(11.2) Congenital Diseases ( )

(11.3) Poisoning ( )

(11.4) Snake bite ( )

(11.5) Any other ( )

12. Co-morbid conditions

(12.1) Hypertension ( )

(12.2) Diabetes Mellitus ( )

(12.3) Both Hypertension and Diabetes ( )

(12.4) Nil ( )

13. Duration of Illness

(13.1) Less than 1 Year ( )

(13.2) 1 – 3 Years ( )

(13.3) 3 – 5 Yrs ( )

(13.4) More than 5 Years ( )

14. Previous history of Kidney Transplantation

(14.1) Yes ( )

(14.2) No ( )

15. Period of haemodialysis in months

(15.1) Less than 6 months ( )

(15.2) 7 – 12 months ( )

(15.3) 13 – 24 months ( )

(15.4) 25 – 36 months ( )

(15.5) More than 37 months ( )

16. Presence of arteriovenous fistula in an arm

(16.1) Right arm ( )

(16.2) Left arm ( )

17. Site of arteriovenous Fistula

(17.1) Radio-cephalic ( )

(17.2) Brachio-cephalic ( )

(17.3) Brachio-basilic ( )

(17.4) Ulnar-basilic ( )

18. Duration of present arteriovenous fistula site use

(18.1) 1- 6 Months ( )

(18.2) 7 -12 Months ( )

(18.3) 13 -18 Months ( )

(18.4) 19 - 24 Months ( )

(18.5) More than 25 Months ( )

19. Time duration of Haemodialysis procedure

(19.1) 2 hrs ( )

(19.2) 4 hrs ( )

(19.3) 6 hrs ( )

20. Frequency of attending Dialysis in a Week

(20.1) Once ( )

(20.2) Twice ( )

(20.3) Thrice ( )

(20.4) Daily ( )

21. Number of Dialysis per Month

(21.1) Less than 5 times ( )

(21.2) 6 – 10 times ( )

(21.3) 11-15 times ( )

(21.4) More than 16 times ( )

22. Amount of Fluid Clearance.

(22.1) 100 – 1000 ml ( )

(22.2) 1001 – 2000 ml ( )

(22.3) 2001 – 3000 ml ( )

(22.4) 3001 – 4000 ml ( )

(22.5) 4001 – 5000 ml ( )

23. Patient Weight in Kilogram

(23.1) Less than 40 kg ( )

(23.2) 40 – 60 kg ( )

(23.3) 61 – 80 kg ( )

(23.4) 81 – 100 kg ( )

(23.5) 101 – 120 kg ( )

24. Techniques of arteriovenous cannulation

(24.1) Area cannulation ( )

(24.2) Rope – ladder technique ( )

(24.3) Button – hole method ( )

25. Size of cannula used

(25.1) 14G (Yellow) ( )

(25.2) 15G (Blue) ( )

(25.3) 16G (Green) ( )

(25.4) 17G (Orange) ( )

26. Complications of arteriovenous fistula

(26.1) Thrombosis ( )

(26.2) Stenosis ( )

(26.3) Aneurysm ( )

(26.4) Infection ( )

(26.5) Nil ( )

PART – C: STANDARDIZED NUMERICAL PAIN ASSESSMENT SCALE

Instruction: The samples are instructed to give response and touch the number in the scale according to the perception of pain.

Key interpretation:

Score	**Level of Pain**
0	No pain
1 – 3	Mild pain
4 – 6	Moderate pain
7 – 9	Severe pain
10	Worst pain

APPENDIX – X

TAMIL TOOL FOR DATA COLLECTION

பகுதி - அ

சமூகக் காரணிகள்

1. வயது

(1.1) 20 வயது முதல் 40 வயது வரை ( )

(1.2) 41 வயது முதல் 60 வயது வரை ( )

(1.3) 61 வயது முதல் 80 வயது வரை ( )

2. பாலினம்

(2.1) ஆண் ( )

(2.2) பெண் ( )

3. கல்வித் தகுதி

(3.1) படிக்காதவர் ( )

(3.2) ஆரம்பக் கல்வி ( )

(3.3) நடுநிலைக் கல்வி ( )

(3.4) உயர்நிலைக்கல்வி ( )

(3.5) பட்டயப் படிப்பு ( )

(3.6) பட்டப் படிப்பு ( )

(3.7) பட்ட மேற்படிப்பு ( )

4. தொழில் விவரம்

(4.1) அரசாங்க ஊழியர் ( )

(4.2) தனியார் ஊழியர் ( )

(4.3) சுயத்தொழில் ( )

(4.4) கூலித்தொழில் ( )

(4.5) விவசாயம் ( )

(4.6) வேலை இல்லாதவர் ( )

5. திருமண விவரம்

(5.1) திருமணம் ஆகாதவர் ( )

(5.2) திருமணம் ஆனவர் ( )

(5.3) விதவை / மனைவியை இழந்தவர் ( )

(5.4) தனித்து வாழ்பவர் ( )

(5.5) விவாகாரத்துப் பெற்றவர் ( )

6. குடும்ப அமைப்பு

(6.1) தனிக்குடும்பம் ( )

(6.2) கூட்டுக் குடும்பம் ( )

(6.3) பெரிய குடும்பம் ( )

7. இரவு நேரதூக்கம்

(7.1) 0 - 3 மணிநேரம் ( )

(7.2) 4 - 6 மணிநேரம் ( )

(7.3) 7 - 9 மணிநேரம் ( )

(7.4) 10 மணிநேரத்திற்கு மேல் ( )

8. உணவு முறை

(8.1) சைவம் ( )

(8.2) அசைவம் ( )

9. தனிப்பட்ட பழக்கங்கள்

(9.1) மது அருந்துதல் ( )

(9.2) புகைபிடித்தல் ( )

(9.3) புகையிலை உபயோகித்தல் (சுவைத்தல்) ( )

(9.4) பாக்கு உபயோகித்தல் (சுவைத்தல்) ( )

(9.5) போதைபொருள் உபயோகித்தல் ( )

(9.6) ஒன்றுக்கும் மேற்பட்ட பழக்கங்கள் ( )

(9.7) ஒன்றும் இல்லை ( )

10. டயாலிசிஸின் போது செய்யப்படும் மனமகிழ் செயல்கள்

(10.1) தொலைக்காட்சி பார்த்தல் ( )

(10.2) இசை கேட்டல் ( )

(10.3) கைப்பேசியில் விளையாடுதல் ( )

(10.4) செய்தித்தாள் வாசித்தல் ( )

(10.5) புத்தகம் படித்தல் ( )

பகுதி – ஆ

மருத்துவத் தரவு

11. டயாலிசிஸ் செயல்முறைக்கான காரணங்கள்

(11.1) நாள்பட்ட சிறுநீரக நோய் ( )

(11.2) பிறவி நோய் ( )

(11.3) நச்சு ( )

(11.4) பாம்பு கடித்தல் ( )

(11.5) வேறு ஏதாவது ( )

12. இருபாதிப்புள்ள நிலைமைகள்

(12.1) உயர் இரத்த அழுத்தம் ( )

(12.2) நீரிழிவு நோய் ( )

(12.3) உயர் இரத்த அழுத்தம் மற்றும் நீரிழிவு இரண்டும் ( )

(12.4) இல்லை ( )

13. சிறுநீரக நோய்கால அளவு

(13.1) ஒருவருடத்திற்கு குறைவாக ( )

(13.2) 1 முதல் 3 ஆண்டுகள் வரை ( )

(13.3) 4 முதல் 6 ஆண்டுகள் வரை ( )

(13.4) ஏழு ஆண்டுகளுக்கு மேலாக ( )

14. சிறுநீரக மாற்று அறுவை சிகிச்சை செய்துள்ள தகவல்

(14.1) ஆம் ( )

(14.2) இல்லை ( )

15. டயாலிசிஸ் எடுத்துக்கொள்ளும் மாதகாலம்

(15.1) 6 மாதங்களுக்கு கீழ் ( )

(15.2) 7 - 12 மாதங்கள் ( )

(15.3) 13 - 24 மாதங்கள் ( )

(15.4) 25 - 36 மாதங்கள் ( )

(15.5) 37 மாதங்களுக்கு மேல் ( )

16. இரத்தகநாள புறவழி செய்யபட்டிருக்கும் கரம்

(16.1) வலது கரம் ( )

(16.2) இடது கரம் ( )

17. இரத்தநாள புறவழி அமைந்துள்ள இடம்

(17.1) ரேடியோ-செ஼பாலிக் ( )

(17.2) பிரேக்கியோ-செ஼பாலிக் ( )

(17.3) பிரேக்கியோ-பெசிலிக் ( )

(17.4) அல்னார்-பெசிலிக் ( )

18. தற்போதைய இரத்தநாள புறவழி தளம் பயன்பாட்டின் காலம்

(18.1) 1 - 6 மாதங்கள் ( )

(18.2) 7 - 12 மாதங்கள் ( )

(18.3) 13 - 18 மாதங்கள் ( )

(18.4) 19 - 24 மாதங்கள் ( )

(18.5) 25 மாதங்களுக்கு மேல் ( )

19. டயாலிசிஸின் கால அளவு

(19.1) 2 மணிநேரம் ( )

(19.2) 4 மணிநேரம் ( )

(19.3) 6 மணிநேரம் ( )

20. வாரத்தில் டயாலிசிஸில் கலந்து கொள்ளும் முறை

(20.1) வாரம் ஒருமுறை ( )

(20.2) வாரம் இரண்டுமுறை ( )

(20.3) வாரம் மூன்றுமுறை ( )

(20.4) தினமும் ( )

21. மாதத்திற்கு டயாலிசிஸின் எண்ணிக்கை

(21.1) 5 முறைகளுக்கு குறைவான ( )

(21.2) 6 - 10 முறைகள் ( )

(21.3) 11 - 15 முறைகள் ( )

(21.4) 16 முறைகளுக்கு அதிகமான ( )

22. தூய்மையாக்கப்பட்ட இரத்தத்தின் அளவு

(22.1) 100 - 1000 மில்லி ( )

(22.2) 1001 - 2000 மில்லி ( )

(22.3) 2001 - 3000 மில்லி ( )

(22.4) 3001 - 4000 மில்லி ( )

(22.5) 4001 - 5000 மில்லி ( )

23. நோயாளியின் எடை

(23.1) 40 கிலோவுக்கு கீழ் ( )

(23.2) 40 முதல் 60 கிலோ வரை ( )

(23.2) 61 முதல் 80 கிலோ வரை ( )

(23.3) 81 முதல் 100 கிலோ வரை ( )

(23.4) 101 முதல் 120 கிலோ வரை ( )

24. தமணி சிரை மூலம் டயாலிசிஸ் புறவழி குழாய் செலுத்தும் முறை

(24.1) பகுதியில் குழாய் மூலம் செலுத்துதல் ( )

(24.2) கயிறு - ஏணி குழாய்மூலம் செலுத்தும் நுட்பம் ( )

(24.3) பொத்தானை - துளை குழாய்மூலம் செலுத்தும் விதம் ( )

25. இரத்தநாள புறவழிகுழாய் ஊசியின் அளவு

(25.1) 14 G (மஞ்சள்) ( )

(25.2) 15 G (ஊதா) ( )

(25.3) 16 G (பச்சை) ( )

(25.4) 17 G (ஆரஞ்சு) ( )

26. இரத்தநாள புறவழி குழாயின் பின்விளைவுகள்

(28.1) தமணியில் இரத்தம் உறைதல் ( )

(28.2) குறுகிய இரத்த நாளம் ( )

(28.3) சிரையழற்சி ( )

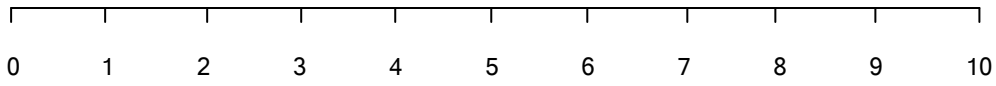
(28.4) நோய்கிருமிகள் ( )

(28.5) பின்விளைவுகள் இல்லை ( )

பகுதி - இ

வரையளவுப் படுத்தப்பட்ட எண்ணியல் வலி தீர்வை அளவுகோள்

பயிற்றுரை: மாதிரிகள் வழி உணர்ச்சிக்கு ஏற்றபடி எதிர்ச்செயல் தரவும் மற்றும் அளவுகோலிலுள்ள எண்களைத் தொடவும் பயிற்றுரைக்கப்படுகின்றனர்



இணை விளக்கம்:

மதிப்பெண்	வலி நிலை
0	வலி இல்லை
1-3	லேசான வலி
4 - 6	மிதமான வலி
7 - 9	கடுமையான வலி
10	மோசமான வலி

APPENDIX – XI

COLD APPLICATION PROCEDURE

"Touch is the language spoken through hands and understood by heart"

INTRODUCTION

Cold application is cutaneous stimulations will promote comfort by reducing the pain. Cold receptors are free nerve endings with thin myelinated fibers; this perception is due to central processing of the peripheral thermoreceptor input. The cutaneous stimulation is an independent nursing intervention which is used in various painful conditions, and is explained by gate control theory.

DEFINITION

Cold application works by reducing blood flow to a particular area, which can significantly reduce inflammation and swelling that causes pain, especially around a joint or a tendon. It can temporarily reduce nerve activity, which can also relieve pain.

ARTICLES NEEDED

- An ice cube in a bowl
- An unsterile glove
- A small towel

PROCEDURE

- Explain the procedure to the patient and obtain consent
- Arrange the articles near to the patient's side

- Take 3 ice cubes and wrap on the unsterile glove.
- Make the patient in a comfortable position.

- Identify the patient's contra lateral hand opposite to the arteriovenous fistula hand.
- Locate the point between the web of the first and second finger. On the dorsum of the hand, between the 1st and 2nd metacarpal bones, in the middle of the 2nd metacarpal bone on the radial side.
- Apply ice cubes on that point 10 minutes prior to the insertion of the catheter needle and which is continued while another staff performing arteriovenous fistula cannulation.
- Stop the cold application after cannulation finished and dry the area.
- Assess the level of pain by using Numerical pain assessment scale for experimental group during arteriovenous fistula puncture after the cold application and also assess the level of pain by using same pain scale for control group during arteriovenous fistula puncture without cold application
- Clean and replace the articles in its proper place as appropriate.

APPENDIX – XII

PHOTOGRAPHS

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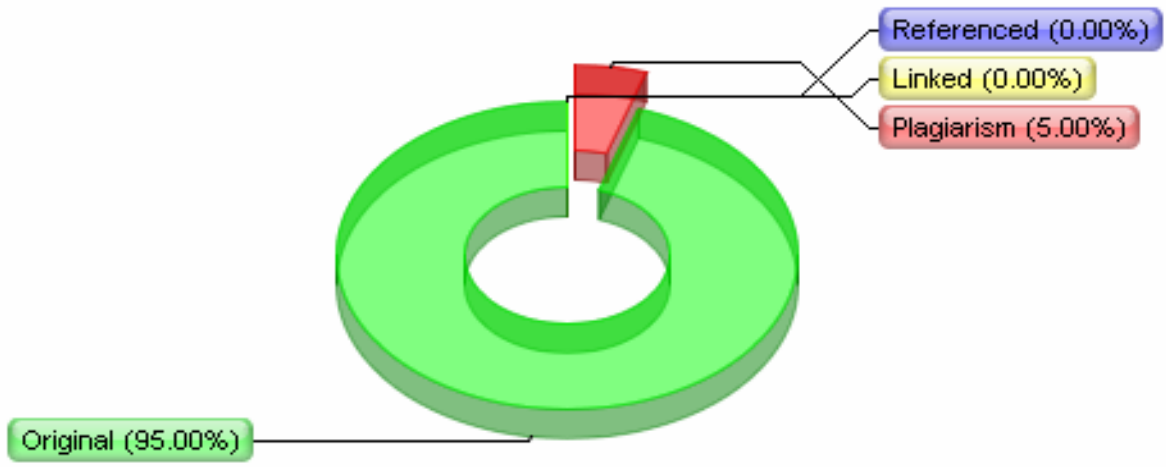

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Acknowledgement

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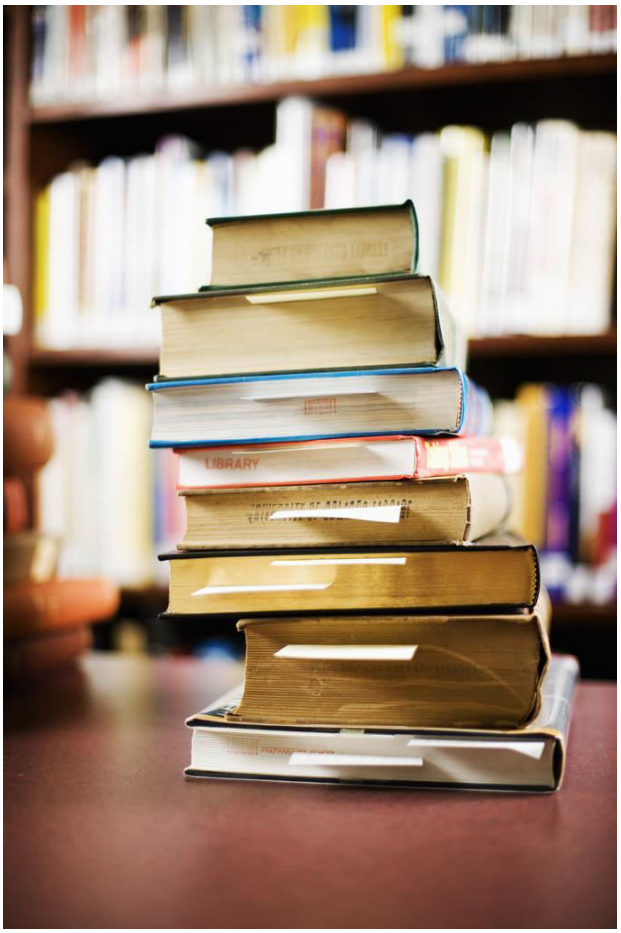

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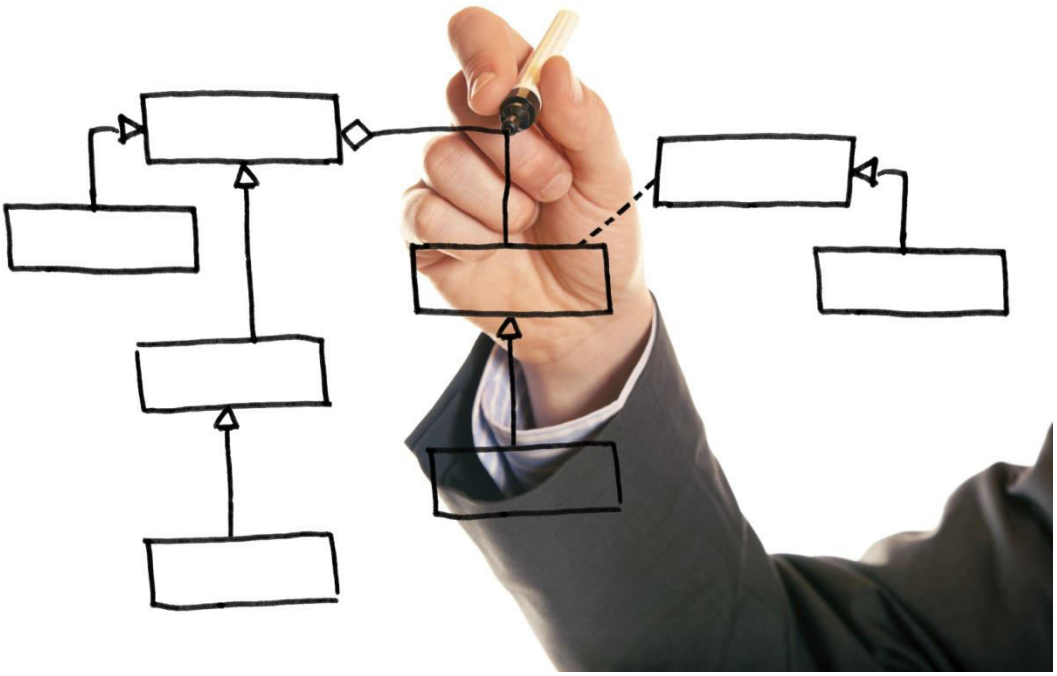

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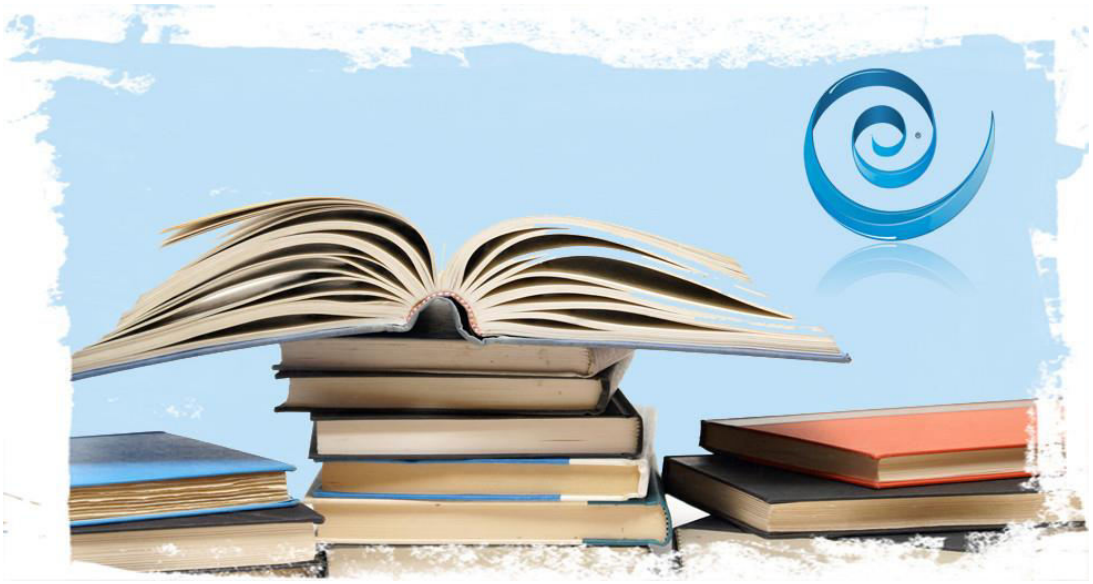

Appendices

Photographs